ENGINEERING NEWS-RECORD

crete weights are added to India-China pipeline before pulling it across the Irrawaddy.

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The CRANE THAT KNOWS *what goes on* 300 FEET UNDER WATER

The story of an electric system that speeds and safeguards crane operation at Shasta

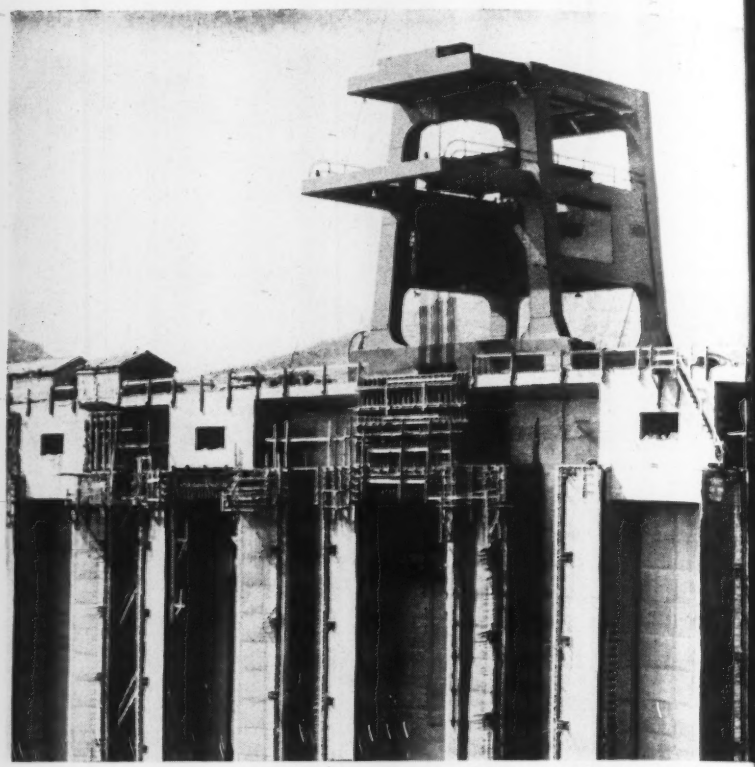
By: J. P. Smith, Industrial Engineering Divisions, General Electric Company

THE heavy lifting at Shasta Dam is performed by a specially designed outdoor gantry-type crane, which travels on tracks embedded in the top of the dam, and across a bridge spanning the spillway. Its major use is in the installation and maintenance of the penstock coaster gates, hydraulic cylinders, and stems at the penstock openings. It will also be used to lower coaster gates to stop the flow of water in any of the outlet conduits below the spillway section. The Star Iron & Steel Company designed and built this unusual crane.

Meets Unusual Requirements

When lifting the gates, the crane must be able to hoist a rated load of 250,000 pounds at five feet per minute. However, the maximum pull that the crane can exert is limited to 300,000 pounds—to safeguard the bridge over the spillway, which is designed for a 150-ton maximum load on the crane. Thus, if a gate should jam in its guides, because of a wedging action or foreign material, even though it may be 300 feet under water, the pull exerted by the crane is limited to the safe maximum of 150 tons.

While lowering the outlet coaster gates into place, the load on the crane may be increased from 105,000 to 220,000 pounds because of hydraulic drawdown. This occurs only if the conduit valve should stick in the open position and make it necessary to lower the coaster gate with the water flowing. The gate is usually lowered at full speed but if hydraulic drawdown increases the effective load on the crane, its speed is reduced automatically without attention from the operator.



(Photo courtesy U.S. Bureau of Reclamation)

Upstream view of Shasta Dam showing 125-ton gantry crane installing unit No. 3 penstock coaster gate. Unit No. 4 coaster-gate hoist and gate stems at left.

An auxiliary hoist operating on a trolley (see picture) is designed to handle gate parts and to install stop logs weighing not more than 25 tons—maximum lift, 295 feet.

Selection of the electric equipment for this crane presented an interesting problem. Several crane motions were involved:

1. Hoisting and lowering by main hoist
2. Hoisting and lowering by auxiliary hoist
3. Movement of auxiliary hoist trolley
4. Travel of entire crane on track of 27-foot gage across dam—partly curved and partly straight

The desirability of smooth, speedy operation, within safety limits for both travel and hoist motions, called for use of a variable-voltage system, with our new Maxspeed drive for the hoist.

A transfer drum-switch arrangement enables the operator to set up the single m-g set and control for one motion at a time.

The Maxspeed hoist drive, providing unique speed-controlling features, accelerates the work of gate handling because light loads are handled rapidly, while heavy loads are handled slowly. For safety, this system enables the crane to handle the 52-ton outlet coaster gates 300 feet under water as carefully as though they were being lifted from a dry-land platform in full view of the operator.

The Maxspeed drive, is applicable to whirley-type, hammerhead, and other cranes where accurate, speedy handling of loads of varying weights must be done frequently. General Electric Company, Schenectady 5, N. Y.

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The Week In Engineering and Construction

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Surplus disposal situation worries equipment men

Fear of intangible postwar situation dominates A.E.D. meeting in Chicago, but better industry relationships and future markets also receive attention.

Despite assurances from Ed. Phillips, their former president and now head of surplus construction machinery division for the Treasury Department, that the amount of surplus equipment at the end of the war is wholly unpredictable at this time and that his government division is laying plans to meet any situation, delegates at the 26th meeting of the Associated Equipment Distributors at Chicago last week did a lot of worrying about what might happen. Complaints on the manner in which the government has already disposed of some surplus stocks seemed to justify their fears in part. Reported practices of negotiating with bidders after bids are opened, secret bid openings, acceptance of late bids after other bids have been opened, rejection of bids lower than "shotgun appraisals" and withholding of low-bid items from group sales, caused much concern at the meeting. The first day of the three-day session was devoted entirely to inter-distributor relations and association affairs. Also, considerable attention was given to future markets by papers presented on the outlook in general construction, river development and flood control, irrigation and power, railroads and airports.

Mr. Phillips, recently appointed director of the construction and farm machinery section, U. S. Treasury procurement division, in charge of surplus equipment, stated that the extent of the impact of surplus property disposal on the economy of the country obviously hinges in large part on the size and nature of the surpluses. His division, he said, has made no forecast because of so many unknown factors in the picture at present, such as length of the war in Europe, and again in the Pacific, amount of property to be manufactured for the military before the end of the war, how much will be destroyed in battle, and what reserves will be retained by the military. The type of surplus goods is likewise unknown at this time.

Mr. Phillips said that his division was just in the process of organization, subject to growing pains, and that many of the mistakes and abuses complained of would be corrected. Of the six methods used so far in disposal of equipment—formal sealed bid, informal bid, negotiated, fixed price, auction and spot sale—he definitely rules out the informal bid and negotiations as unsatisfactory. He believes the best method of disposal of equipment is through dealers and distributors, especially as much of it must be repaired and serviced before it can be of use to the consumer. He outlined the policy of his division as follows: Best interests of the war program, most equitable distribution geographically and according to need, speedy distribution, highest return to the government considering all pertinent factors, and most satisfactory service to the consuming public.

Industry views expressed

William Danner, Hyde Park, Mass., reporting for the A.E.D. surplus property committee, deplored the "bad ethics" of treasury procurement in recent past sales, and pleaded for an adoption of a policy of sealed bids, public opening, certified check to accompany all bids, and acceptance of the high bid when three or more proposals are submitted. He stated A.E.D. was only seeking an "orderly liquidation of a vast surplus."

M. B. Garber, Thew Shovel Co., speaking for the manufacturers, said it appears there will be new equipment left in manufacturers' hands in the production stage amounting to $250,000,000, representing more than six months' normal peacetime output. He believes this equipment can best be disposed of by the Milwaukee Plan, first proposed by F. O. Salditt of Harnischfeger Corp., whereby the government assumes temporary ownership, but lets the manufacturers dispose of the surplus through

Prominent in convention activities were: Past president Ed. P. Phillips, (left) recently appointed director, Construction Machinery and Farm Equipment Section of the Treasury Surplus Property Division, and H. O. (Ham) Penn, newly elected president of A.E.D.

their regular sales channels at a predetermined rate. As for government-owned used machinery, Mr. Garber recommends that all items made prior to 1937 be junked and charged off to the war. The later machines should be sold through distributors at a determined ratio with new equipment at a price not less than a certain percentage of expertly appraised value, otherwise the item should be scrapped. He also declared there is just as much speculative danger in spare parts as in equipment items, and if we leave a large number of machines overseas for foreign governments, then a year's supply of spare parts for such equipment should be sent over from military stocks in this country.

Speaking for the distributors, Harry Shaw, Philadelphia, declared that in tackling "one of the greatest merchandising tasks of all time, the government should come out with a clear-cut policy of orderly liquidation and stand by that policy." He pointed out that distributors handled the building up of the great stock of government-owned equipment and they are in the best position to demobilize those stocks. He pleaded for uniform sales procedure, prompt confirmation of all sales, and holding of sales in proper sequence to permit time for dealers to get from one to another.

John Moore, of Denver, reported the recent Kearney, Neb., and Salina, Kan., sales by the procurement division, as generally satisfactory. Each item was numbered to correspond to a catalog list and bidding was by cards, with only the highest bidder announced, and the sale was completed and paid for on the spot. Improvements suggested by Moore for future sales included prequalification of bidders to assure that only legitimate dealers were bidding, elimination of junk items, the government to supply repair parts needed for rehabilitation on the theory that casual inspection of a used piece of equipment could not reveal the amount of repairs necessary to put it into good condition, and more information and serial numbers to be included in catalog descriptions. L. W. Gardner, Portland, Ore., suggested junking of 90 percent of equipment now held by the government as "too much time and money has been spent in disposal of CCC, Forest Service and WPA junk that should have been disposed of long ago," a proposal that was met with loud cheers from the audience.

An open forum discussion of the surplus equipment problem was devoted mostly to means of keeping irresponsible dealers from getting hold of the machines. OPA ceiling prices will govern all sales, according to answers to specific questions of that nature.

H. O. Penn, of New York, newly-elected president of the association, declared the postwar period looks good because of the great need of earthmoving and construction machinery. Concerning disposal of surplus equipment, Penn said "the government should not gamble against business and bidding on equipment should be done openly at all times, with sale of all surpluses handled through regular business channels. While we carry on in the war effort in supplying parts and services, we have to reach an agreement with the federal government on surplus disposal if we are to remain in business and to be in a position to do our job in the great postwar expansion period."

U. S. Army Engineer plans

Reporting on the status of U. S. Army Engineer plans for postwar construction, Maj. Gen. Eugene Reybold, chief of engineers, declared that detailed plans and specifications are now ready for an estimated $500,000,000 worth of flood control work, river and harbor improvements and allied multiple-purpose projects. Moreover, present planning schedules contemplate the completion of sufficient plans and specifications to permit the initiation of work on additional projects totaling $231,000,000 by the latter part of this summer, he said.

The potential postwar civil works program of the U. S. Army Engineers totals $4,600,000,000, said General Reybold. This includes projects adopted by Congress amounting to $3,063,000,000, and other economically justified projects recommended in survey or review reports that have been submitted to Congress.

General Reybold lashed out at those critics of postwar planning, who claim directly or by innuendo that "pork-barrel" funds are considered for any proposed U. S. Army Engineer construction. In reality, such public works projects are instigated by the people themselves through petitions made to Congress. The Corps of Engineers has no authority to commence investigations on any such project until authorized to do so by Congress, asserted Gen. Reybold, and no actual construction is begun until the engineering investigations have been reviewed by division engineers, the chief of engineers, and the War Department. The very manner in which U. S. Army Engineer civil works construction is planned and executed precludes the possibility of its containing any "pork-barrel" funds, he said.

Postwar reclamation work

A general picture of the Bureau of Reclamation plan for postwar construction was presented by William E. Warne, assistant commissioner, Washington, D. C. The Bureau of Reclamation proposes nothing less than the full development of the water and related natural resources of the West, declared Mr. Warne. Included in this plan would be provisions for increasing the present 21,000,000 acres of irrigated land in the 17 western states to some 43,000,000 acres.

In doubling this irrigated area large dams will be built which also will furnish low-cost hydroelectric power, agricultural and industrial production will expand, population of the West will increase materially and the national income will be increased by several billions of dollars a year, said Mr. Warne. All of this, however, is not expected to be accomplished immediately. But a substantial postwar program costing well over $3,000,000,000 has been laid before Congress, he said.

Present plans for immediate postwar construction call for irrigation of 10,000,000 new acres of dry but fertile soil on some 300 separate projects, and supplementing the water supply to another 10,000,000 acres now inadequately irrigated. Postwar plans of the Bureau of Reclamation also contemplate adding more than 4,000,000 kw. of firm power which will more than double the present installed firm power capacity of the West, declared Mr. Warne.

Fifteen separate studies are planned by the Bureau, with each covering a large river basin in the West. The first of these, covering the Missouri River Basin, has been completed.

(*Continued on page* 10)

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Technical sessions of Am.Soc.C.E. devoted to problems of profession

Flood regulation, bridge design and kindred matters of normal interest characterize the annual meeting. Postwar needs are cited.

Devoid of any subjects that captured the general interest, except for a few papers on postwar planning progress, the technical sessions of the 92nd annual meeting of The American Society of Civil Engineers could be characterized as reflecting the normal problems of the engineering profession. Thus, the construction division devoted its discussions to contract and specification problems, the hydraulics and waterways groups conducted a symposium on flood flows and regulation, and the structural division concerned itself with a symposium on the Brooklyn Bridge.

Detailed accounts of these meetings, including a report on the surveying, highway and sanitary engineering sessions, is given in the following. What happened at the business meeting of the society was reported in last week's issue.

Aerial and ground surveys

In the session devoted to surveying and mapping Wilbur H. Simonson, principal landscape architect, Public Roads Administration, Washington, D. C., by use of lantern slides showed tables giving the scales to specify for most effective use of aerial surveys in combination with ground surveys. He stated that although scales smaller than 500 ft. to 1 in. have proven useful in the initial study stages of most engineering projects, larger scales have been found necessary in the later plan stages where more detail is required.

During the surveying sessions attention was drawn to the fact that nine states have formally adopted the plane-coordinate system devised for the various states by the U. S. Coast and Geodetic Survey for transforming geographic-position data for use in plane-surveying operations. Louisiana was the last state to adopt the method, the states of Kentucky, New Jersey, Mississippi, Texas, Massachusetts, North Carolina, Pennsylvania and New York having already done so.

Legislation to authorize use of this system has been prepared for the remaining states.

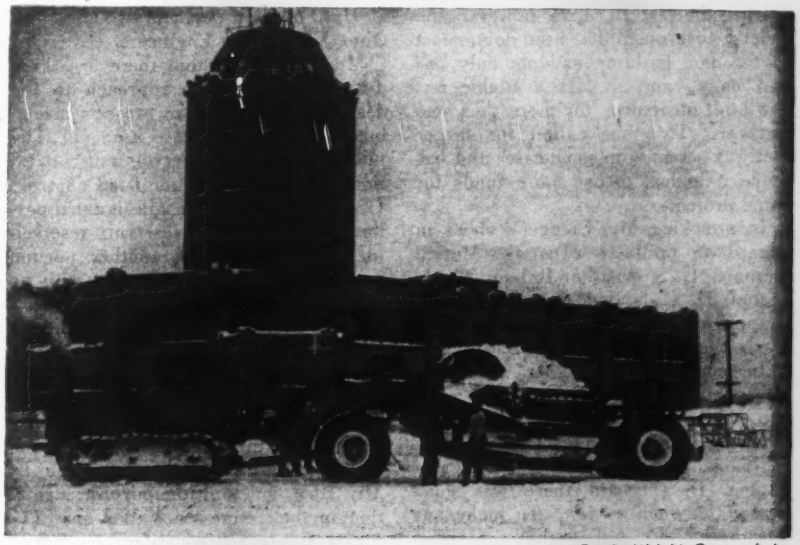
In discussing methods for obtaining passage of such laws, the general agreement was that state engineering societies, municipal engineering groups and local sections of national engineering societies can do much more than can the headquarters staff of national societies.

Robert H. Randall, president of Commission on Cartography of the Pan American Institute of Geography and History, stated that all the Latin American countries represented at a meeting in Mexico City last year adopted as standard scale for aeronautical charts that of one to one million used by the U. S. Army Forces. He went on to explain that the procedure receiving greatest approval for improving surveying method in Latin America is that of sending a selected group of engineers and technicians to this country for training, and later to employ United States firms and engineers as consultants to obtain maximum benefit from the U. S.-trained personnel and American-made equipment. Brazil is already well advanced on such a plan and is now employing outside help.

Symposium on flood regulation

Much discussion was created by a paper presented at the symposium on flood regulation by William P. Creager, consulting engineer, Buffalo, N. Y., entitled "Limitations in the Accuracy of Flood Studies."

After outlining the widely accepted method of flood studies for dams—a procedure making use of a unit hydrograph and the transfer of the calculated maximum possible rainfall to the drainage area under study—Mr. Creager went on to express the following conclusions: It is too intricate for many engineers to use; the procedure is not approved by numerous designers on the ground that the refinements and amounts of work involved are not commensurate with the accuracy of the basic assumptions; that some engineers hold that the method results in the use of a design flood that is much too large; and that other engineers, while approving of the method in general, criticize



Curtiss-Wright Corp. photo

Carrying scrapers help clear Buffalo airport

Snowfall to Jan. 15 in the Buffalo area was more than 70 in. with an average accumulated level on the field of about 36 in. Runways have been kept usable by four 3½-ton trucks with one-way blades, one 12 ton truck with blades and wings, two powered snow-throwers and an angle-dozer.

Plows pile up snow at the intersections of runways, however, and there carrying scrapers have been used to move the snow well away from the area to prevent accumulation of snow and subsequent drifting. The units are crawler-tractor-drawn, are self-loaded without difficulty, do not damage the airport surfaces and unload and spread the snow without delay.

The scrapers are used also around the apron and outside the field near the control building to avoid snow piling up to dangerous heights. The tractors and loads readily stay on top of the snow to discharge on a high "spoil bank."

Scrapers are contractor-owned equipment that would otherwise be idle during the winter months. According to Nat Duffy, airport manager, this scheme has been used at the Buffalo airport for the past two years and has proved entirely satisfactory.

severely the design storm rainfall forming the basis of the studies.

Mr. Creager not only attacked the method because of the many opportunities for errors in deriving the basic data and possibly in the application of the unit hydrograph, but he went on record as considering the resulting flood figures as applicable only to preliminary estimates or to the design of unimportant structures. He stated that he believes the method adaptable only to small areas where channels of flow are regular and the difficulty of computing the velocity of flow is not great. He also observed that the matter of probability had been greatly neglected in flood studies. In view of these limitations, he believes that the spillway capacities of many old dams are too small and that a number of recent dams have capacities which may be greatly in excess of that required for reasonable protection.

Discussing Mr. Creager's paper, William G. Hoyt, Department of Interior, Washington, D. C., pointed out that during the early development years in the country most dams were built by private organizations with limited funds at their command and frequently with limited data as to rainfall and runoff. During the last 10 years, however, the federal government has been doing most of the dam building and not only has had more rainfall data available but has built structures for more than one purpose. This has called for larger spillway capacity in some cases and has made it logical to use more funds for some projects.

In attacking Mr. Creager's views in regard to spillway capacity, Merrill Bernard, U. S. Weather Bureau, Washington, D. C., stated that an increase in spillway capacity does not necessarily mean a proportional cost raise.

In commenting on Mr. Creager's viewpoint that derivations by the modern method result from piling contingency upon contingency, Gordon L. Williams, U. S. Army Engineers, Washington, D. C., said there was good reason for such a view. To make any assumption other than that the reservoir was full would be completely ignoring the record of experience in eastern and central United States."

Analysis of floods

Five major questionable elements in the complete analysis of floods were outlined by Emil P. Schuleen, U. S. Army Engineers, Pittsburgh. These elements were : (1) Whether the selected spillway design storm, with snow melt if applicable, represents too remote a possibility for use as a design criterion; (2) whether the assumed infiltration and base flow rates may logically be expected to be concurrent with the selected design storm; (3) whether a unit hydrograph based on a moderate flood need be adjusted to make it representative of the run-off distribution during a storm of the selected design proportions; (4) whether the assumed condition of the reservoir and outlet facilities is a fair estimate of those that probably would be effective during the selected design storm and flood; and (5) whether the wind conditions assumed in estimating the wave height may be expected concurrently with passage of the spillway design flood.

It was Mr. Schuleen's conclusion that there is much opportunity for study and research in regard to the methods used, and that the design of large and important dams located in well developed regions should continue to be based on conservative assumptions.

Multi-purpose reservoirs

Two papers dealing with operation of multi-purpose reservoirs also created considerable interest and comment at the symposium on flood control. One was presented by Clarence E. Blee, chief engineer, Tennessee Valley Authority, and the other by Col. Charles L. Hall, division engineer at Columbus, Ohio, U. S. Army Engineers.

Mr. Blee stated that there are three different methods of approach to the design of multi-purpose projects involving flood control. These are: (1) The philosophy that a reservoir must at all times be kept empty for flood control; (2) that there must be a designated portion or layer of the reservoir reserved for flood control and another portion for other of the multiple uses with no common use of the same space; and (3) that the same space in a reservoir may be used both for flood control and for other purposes at different seasons.

Mr. Blee explained each of these concepts has its proper place and each has been successfully and economically employed. Conditions seen favorable by Mr. Blee for multiple-purpose operation in the Tennessee Valley are: (1) Major floods are consistently confined to a definite flood season; (2) topographic conditions and extent of improvement in the reservoir areas favor the production of relatively large storage capacities at moderate cost, and (3) the annual run-off cycle favors the required degree of filling of the reservoirs after the end of the flood season.

Upper Ohio work advanced

Col. Hall in describing flood control facilities on the upper Ohio River stated that 23 reservoirs have been completed by the U. S. Army Engineers to control a total drainage area of about 8,600 sq. mi. and provide a total maximum flood control storage capacity of about 2,700,000 acre-ft. on the headwaters of that stream. The total cost of the 23 reservoirs was $119,800,000 which is about one-fourth of the cost of all the reservoirs in the plan.

In speaking of the benefits to be obtained from the flood control system for the Upper Ohio, Col. Hall stated, "Completion of all the authorized and recommended reservoirs in the comprehensive plan for the Allegheny and Monongahela River basins will assure reductions of from 5 to 14 ft. at Pittsburgh in major floods such as those of March 1936, December 1942, and March 1907, the three highest of record. It is estimated that the 1936 flood stage would have been reduced from 46 to 32 ft. and the 1942 and 1907 floods to a somewhat lower stage. The reduced crest stage for probable maximum flood conditions will be about 36 ft."

Operation of the Pittsburgh flood control system was described by Emil P. Schuleen, U. S. Army Engineer district office. In each case, the governing conditions are stated as specific values of time, stage or elevation, and the corresponding operating instructions are stated as specific values of opening for the needle valves or gates in the outlet control works. The number of the particular valves or gate to be used is also given to provide, as far as possible, for symmetry of flow in the stilling basin when more than one outlet is in use.

Sanitary engineering session

A clue to what promises to hold the spotlight of attention for sanitary engineers in the next few years was revealed in a progress report of the committee "on evaluation of professional objectives in the design of sanitary engineering works", made by Thomas R. Camp, chairman. Mr. Camp, a consulting engineer, outlined the committee's assignment, which concerns itself with the influences of proprietary equipment upon the development of economical plans best suited to meet the needs of communities or industry.

The formation of such a committee, stated Mr. Camp, appears to result from the growing practice by promoters of patented processes or equipment to control or limit the selection of treatment processes for water and sewage. He also pointed to the growing practice by promoters of selling direct to clients with engineering services furnished free, thus by-passing engineers in private practice.

Fully cognizant of the controversial nature of its assignment, the committee expressed the hope that its final report "may influence the actions of clients and promoters."

Water supply on the battlefront was

ewed by Capt. William H. Smith, C., Bureau of Yards and Docks, stated that the low incidence of ase proves how successfully we e coped with unusual and difficult ditions. Much of this success must attributed to the special adaptation equipment, he said, including mobile er systems that have stood the severe of operating in the cold of the utians as well as the heat of the gles. He paid a tribute to manu- turers who have designed equipment t is rugged, light-weight, compact, cient, reliable, easy to place in serv- and to operate.

South American opportunities

Opportunities for sanitary engineers unlimited in South America, stated n P. Hogan, consulting engineer of rsons, Brinckerhoff, Hogan and Mac- nald, New York, in describing future sibilities of American engineers in tin American countries. He cited rts and harbor development as next importance, followed in order by hway and railroad construction. Mr. Hogan pictured South American ntries to be lacking in funds and d they had spent too much of what y had for adornment of cities and enough on those things which raise ng standards. Sanitation facilities, particular, are badly needed. Mr. gan lauded the activities of the U. S. blic Health Service in South America, ting that this agency had played a jor role in making Latin Americans are of sanitation deficiencies. This tement created much interest because retofore there has been no official nouncement that the U. S. Public alth Service was operating in South erica, let alone on the large scale plied by Mr. Hogan.

Discussion by Edward J. Cleary, naging editor of *Engineering News-Record*, questioned the probability that rth American sanitary engineers uld find many job opportunities uth of the border unless the United ates government continued to finance d direct operations, as it has been ng through the Office of the Coordi- tion of Inter-American Affairs. As a r measure, this agency undertook e greatest program of sanitation work er promoted in Latin America by the ited States and in so doing gave em- oyment to a number of engineers, ost of whom were assigned from the rmy Sanitary Corps. This activity is w coming to a close.

Improved specifications

Dedicating the entire session of the nstruction division to contracts and ecifications, Adolph J. Ackerman, rector of engineering, Dravo Corp. and chairman of the division, discussed the need for a standard form.

Rolf T. Retz, senior civil engineer, National Advisory Committee for Aeronautics, Langley Field, Va., presented some basic principles to guide the specification writer in producing a better product. With respect to the writing of contracts, he said that the golden rule is to say a thing once only and not repeat. He also gave as a rule: Do not split portions of the work among several contractors when such portions depend upon each other for structural features or sequence of operations. With regard to specifications, he thought it was more important to be definite than right. To overcome the biggest problem, namely, the inertia of established procedure and canned specifications, he suggested that "the governmental agencies should permit greater freedom of action down the line, down to the grass roots."

Fundamentals outlined

General principles underlying specifications that are conveniently workable and at the same time fair to both parties of the contract were described by Roger W. Armstrong, deputy chief engineer, Board of Water Supply, New York, N. Y.

"The attainment of such specifications," he said, "will be greatly facilitated if their preparation is undertaken with the viewpoint that the engineer is serving the contractor as well as the owner and that the contractor and the engineer are partners in obtaining for the owner the desired character of finished structure at a reasonable cost."

Presenting the viewpoint of the contractor, Arthur A. Johnson, president of the Arthur A. Johnson Corp., saw the need for two types of contracts—one for buildings and one for heavy construction. Praise was given to both the New York city and state departments of public works, for their recent procedures in revising contracts and specifications. These departments invited the cooperation of lawyers, engineers, contractors and architects in producing new forms.

Brooklyn Bridge indeterminate

The structural division, in a symposium on the Brooklyn Bridge, heard O. H. Ammann, consulting engineer, New York, N. Y., describe the structure as highly indeterminate. Investigating the bridge with a view toward improvements to fit it to present traffic conditions, he found it necessary to make many simplifying assumptions. In effect, the load can be considered to be carried by the cables and by the stiffening trusses with hinges at the center of the side spans and of the middle span. However, the analysis of distribution of load to the cables was further complicated by diagonal stays in the plane of the cables connecting to the towers. Mr. Ammann proposed that the existing pair of railroad tracks and two-lane roadways be replaced by two three-lane roadways. Very little change would have to be made in the floor system, and one of the center stiffening trusses could be more efficiently used on the outside.

Cable rollers frozen

Nomer Gray, civil engineer, Department of Public Works, New York, N. Y., in making field observations on the bridge, found that the rollers under the cables at the top of the towers had not moved in years. Although the resulting stress must have been taken up in bending by the towers, the granite block masonry still is in excellent shape. As a whole, the bridge, although more than 60 years old, was found by the inspectors to be in pretty good condition.

Tests of the materials in the cable made under the supervision of Prof. Harold E. Wessman, chairman, department of civil engineering, New York University, indicated that the wires had an ultimate strength of more than 162,000 lb. per sq. in. on the average and a modulus of elasticity of about 28,700,000 lb. per sq. in. Some of the members of the stiffening trusses were found to be overstressed, and this was attributed to overtightening of the counters.

Buckling formula for beams

Discussing the inadequacy of existing formulas for lateral buckling in beams, Karl De Vries, designer, Bethlehem Steel Co., said that compression flange formulas now used neglect the moment of inertia of the flange and the restraining effect of the tension flange, which decreases with the depth of the beam. He offered several new formulas, based on experimental research as well as mathematical analysis, using as a variable instead of l/b a function c equal to ld/bt, in which l is unsupported length of flange, d depth of beam, b flange width and t thickness of flange.

For short beams, Mr. De Vries gave different formulas for different steels. For carbon steel he recommended $18{,}000 - 0.006c^2$, for silicon steel $24{,}000 - 0.014c^2$, and for nickel steel $30{,}000 - 0.024c^2$. For long beams he suggested for all steels $12{,}000{,}000/c$ and gave as the transition point between short and long beams for the three types of steel $c = 1{,}000$, 700 and 500, respectively. He suggested that these formulas might be used for plate

(*Continued on page* 12)

Pipeline to Victory in Burma

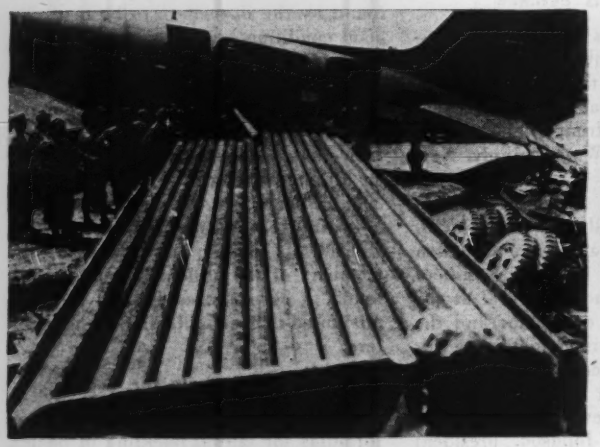
Construction of the India-Burma-China pipeline from Calcutta up the Brahmaputra Valley through Assam into north Burma, a distance of 2,000 miles, has been completed according to a recent announcement by Lieut Gen. Daniel I. Sultan, commander of U. S. forces in the India-Burma theater. When extended into China's Yunnan Province, this line will be the longest oil supply line in the world.

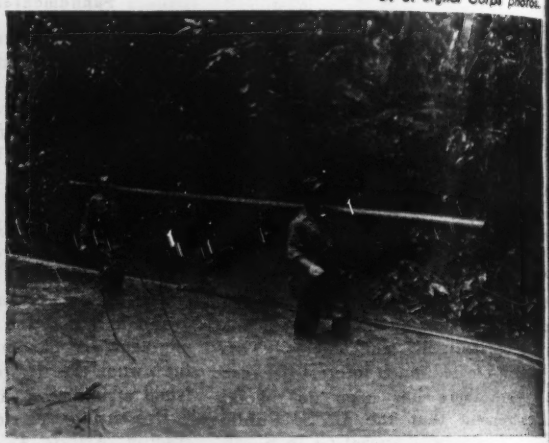
The accompanying illustrations depict some of the problems encountered during construction and how they were solved. To speed up operations, for instance, much of the pipe was flown in from India by C-47 cargo planes; rain, mud and jungle complicated construction, which called for sheer force of will to push the job to completion, despite all handicaps.

Constructed of light-weight, 14-gage welded steel tubing of 4-in. and 6-in. O.D., the pipe was delivered in 20-ft. lengths, which averaged about 67 lb. per section for the smaller size. The sections were joined together by a specially designed coupling, which consist of two bolts and a rubber gasket. The smaller pipe has a capacity of 200 bbl. per hour, and the 6-in. carries 600 bbl. A force of 200 engineer troops laid an average of three to ten miles of the pipeline per day, depending upon the condition of terrain and supplies. Pumping stations, serviced by centrifugal or reciprocating gasoline-powered pumps, were installed at about ten-mile intervals along the line.

Construction of the pipeline is a completely American job and ranks in importance with that of the Ledo Road. The project was handled by the construction forces of the Services of Supply headed by Brig. Gen. Thomas F. Farrell, former chief engineer of New York State. Maj. Gen. W. E. R. Covell is commanding general, S.O.S. Details for the pipeline were worked out by Lieut. Col. Arthur D. Small, chief of the Petroleum Distribution Branch, Office of the Chief of Engineers, assisted by Capt. Joe J. King, executive officer of the P.D.B.

U. S. Signal Corps photos.





To speed construction operations, pipe for the India-Burma-China oil supply line was delivered by C-47 cargo planes from supply depots in India. Right: Rain, mud and jungle complicated construction; troops of the 776th Engineer Petroleum Distribution Company are shown delivering a section of 4-in. dia. pipe in a flooded area.

Gate valves were installed at frequent intervals along the line. Right: Preliminary to pulling the pipeline across the Irrawaddy River, concrete weights were added at each joint to keep the line submerged when once in place.

India-China supply road opened for passage of military traffic

Movement of Allied supplies marks joining of new Ledo Road with rebuilt Burma Road. Short-cut saving 100 miles also completed.

The Ledo-Burma Road connection between India and China, renamed Stilwell Road by Generalissimo Chiang Kai-shek in honor of Gen. Joseph W. Stilwell, planner and chief advocate of the artery, was officially declared open to military traffic on Jan. 25. At that time Lieut. Gen. Daniel I. Sultan, commander of the India-Burma theater, announced that the route had been cleared of Japanese troops and was ready to handle convoys. This followed closely his disclosure that construction had been finished on the last stretch linking the two roads and that a new short-cut across the mountains from Myitkyina to the Burma Road by way of Tengyueh and Lungling, saving almost 100 miles over the route by way of Bhamo, had been completed.

Opening of the nearly 400 miles of all-weather road comprising the Ledo Road (*ENR*, Sept. 30, 1943, vol. p. 596) portion of the highway represents a major milestone in U. S. Army Engineer history. Called "Pick's Pike" by the men using it, because Brig. Gen. Lewis A. Pick was in charge of its construction, it was described by Lieut. Gen. Brehon S. Somervell, Army chief of supply, as "the toughest road construction job ever attempted."

Hacked through Burma jungles, the Ledo Road leaves railhead of the Assam State Railways at Ledo, India, crosses the Pagoda and Punkin mountain ranges, and follows the Hukawng, Mogaung and Irrawaddy valleys to Myitkyina. It then runs south to the river port of Bhamo, where it meets the northern leg of the Burma Road, leading to Kunming, China, and by this meeting signalizes the victorious achievement of men from the United States, China, Great Britain, India and Burma in their two-year battle against jungle diseases, sweeping monsoon rains and Japanese troops.

The Burma Road, of course, is not a new highway. It was started from Kunming in 1920 along the general route of an old spice and tea caravan trail toward Burma and was opened by late 1939 to Wanting, Yunnan Province border village. By then the government of Burma had built roads connecting Wanting with the Irrawaddy River ports of Bhamo and Rangoon and with the railhead town of Lashio. It was at this time that the Chinese National Government took over the road from the province (*ENR*, May 4, 1939, vol. p. 627).

In early 1943, when American engineers started cooperating with China's Yunnan-Burma Highway Engineering Administration, the road was essentially a one-track, all-weather road. Maximum grade was 21 percent with numerous short grades exceeding this. Curves were of very short radius and in mountainous sections the road was as narrow as 8 ft.

Subsequent rebuilding of the road was carried on mostly by hand labor because of the scarcity of equipment and the necessity of flying everything in over Burma's famous "Hump". American participation in this reconstruction of the Burma Road has consisted of engineering advice, operational instructions, some supplies, persuasion, friendship and personality of a small, hand-picked group, now called Burma Road Engineers, under the command of Col. Louis Y. Dawson, Jr., U. S. Army Corps of Engineers. All money has been allotted by the Chinese government to and spent by Chinese officials of the Yunnan-Burma Highway Engineering Administration, and the Chinese have furnished engineers, labor, supplies and material.

While reconstruction of the Burma Road, like construction of the Ledo Road, is related to military expediency, the India-China route is seen as holding possible broad significance in postwar development of Asia. If, for instance, other hazardous pack trails from China are widened into highways, Asia, heretofore divided by nature, may become more closely knit.

Just opened throughout its entire length from India, the overland supply route to China includes the recently completed Ledo Road, the newly rebuilt Burma Road and a new cutoff between them. The road has been renamed Stilwell Road, in honor of Gen. Joseph W. Stilwell.

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Army Engineer Officers to be promoted

Last week President Roosevelt recommended to the Senate that two officers of the Corps of Engineers, U. S. Army, be advanced from brigadier to major general and eight from colonel to brigadier general.

Brig. Gen. Clarence L. Sturdevant, now assigned to the Southwest Pacific area and formerly chief of the Troops Division, Office of the Chief of Engineers, was nominated for promotion, as was Brig. Gen. Lief John Sverdrup, senior partner in the consulting firm of Sverdrup & Parcel, St. Louis, Mo., and now also on duty in the Southwest Pacific area.

Eight new brigadiers named

The eight officers recommended for promotion from colonel to brigadier general are: Frank S. Besson, Jr., now overseas as assistant director of the railway service, Persian Gulf Service Command and previously chief of the engineering and development branch, supply division, Office of the Chief of Engineers; John F. Conklin, who served as district engineer at Huntington, W. Va., and Norfolk, Va., before the war and now on an unannounced assignment overseas; Gene W. Hall, also on an unannounced overseas assignment and for many years previous to the war associated with Parsons, Brinckerhoff & Douglas, New York consultants; George A. Lincoln, who early in the war served with the European theater of operations and since May, 1943, has been assigned to the General Staff in Washington; John J. O'Brien, chief of the real estate division, Office of Chief of Engineers; Francis H. Oxx, an army officer since 1920, once district engineer at Kansas City, and now on an unannounced overseas assignment; Bernard L. Robinson, engineer officer since 1920, once assistant district engineer at Memphis and Honolulu, and since 1942 assigned to the Southwest Pacific area; and Walter K. Wilson, Jr., 1929 graduate of West Point, once commanding officer at Camp Phillips of the 1113th Engineer Combat Group, and since October, 1943, on an unannounced overseas assignment.

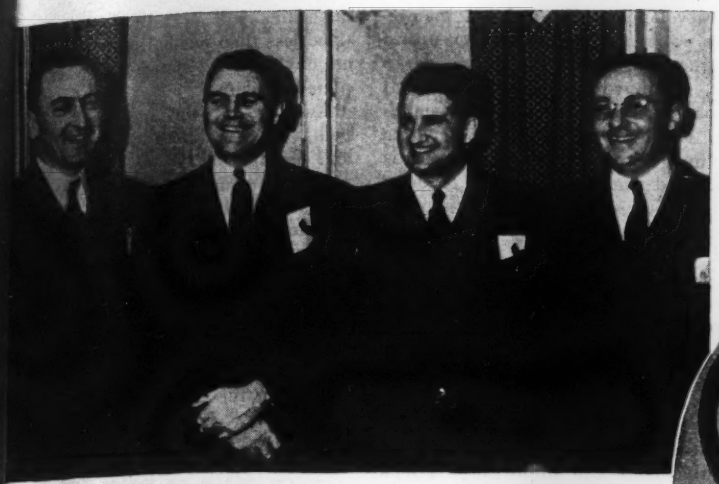
Details of concrete placing at Saluda Dam near Columbia, S. C., are discussed by E. H. CARLTON (left), concrete technician for the South Carolina Electric & Gas Co., Columbia, and JOSEPH E. KOWALSKY, supt. for Gilbert Associates, Inc., Reading, Pa.

C. F. BOND, now maintenance engineer with the Georgia State Highway Department, has been with that organization continuously since 1920, except for 2½ years leave to build airports in Georgia and Florida as part of the present war program.

MEN AT WORK

W. J. DAVIS (left), division mechanic at Tarboro for the North Carolina State Highway and Public Works Commission, and E. S. PEABODY, maintenance supervisor at Elizabeth City for the commission, get together to determine how they overcame the shortage of spare parts and other problems.

MARION R. KAYS (right) of Atlanta, Ga., receives certification telling of his selection for life membership to the American Society of Civil Engineers from JAMES CARTER PRATHER, operating superintendent for Rich's, Inc., Atlanta, and 1944 president of the Georgia section of the Society.



Reason for the smiles is the fact that these men are about to enjoy the annual dinner-dance meeting of the Georgia section, American Society of Civil Engineers. They are, left to right: H. H. PERKINS, vice-president of the section and supervisor of airports at Atlanta for the Civil Aeronautics Authority; J. C. PRATHER, 1944 president of the section and operating superintendent of Rich's, Inc.; M. T. THOMSON, 1945 president and district engineer at Atlanta for the U. S. Geological Survey, and PAUL WEIR, a director of the section and assistant general manager of the Atlanta Water Works.

ROBERT F. BLANKS, Denver, Colo., is shown with the equipment he invented for controlling the rate of load application in materials testing. A graduate of Kansas State College, he has been a civil engineer with the U. S. Bureau of Reclamation for the last 14 years.

Holding both engineering and law degrees and a member of the Colorado Bar, WILLIAM E. CORFITZEN is now acting as coordinating officer in the Washington, D. C. liaison office of the Bureau of Reclamation. Mr. Corfitzen has a wide technical experience, having held engineering positions with the New York State Highway Department, the Long Island State Park Commission, and the Coast and Geodetic Survey before joining the bureau.

New officers of the North Carolina section of the American Water Works Assoc., and the North Carolina Sewage Works, Assoc., elected at a recent joint meeting of the executive committees of the two organizations. They are, left to right: L. I. LASSITER, Wilmington sanitary engineer, vice-chairman; E. M. JOHNSON, waterworks superintendent at Raleigh, chairman; and D. M. WILLIAMS, waterworks and sewage treatment superintendent at Durham, secretary-treasurer.

Surplus equipment

(*Continued from page 2*)

Another, covering the upper and lower basins of the Colorado River area soon will be completed and the 13 other river basin reports will follow within the year, said Mr. Warne. Regarding the rate at which the proposed $3 billion reclamation program could be launched after the war, Mr. Warne declared that $164,000,000 could be placed under contract the first year; $360,000,000 the second; $450,000,000 during the third year and $500,000,000 each year thereafter until the program is completed.

Railroad maintenance equipment

Railroad maintenance with construction equipment will increase substantially after the war, according to G. M. Magee, research engineer, Association of American Railroads. Train operating speeds undoubtedly will increase sharply calling for extensive reduction in track curvature throughout this country. Much grading equipment will be required for this work. Another important phase of the railroad improvement program also related to high speed operation will be in grade separation work. Expected to be resumed on a large scale after the war, this program alone will require much grading equipment of all types and equipment for making concrete and erecting steel, he said.

Mr. Magee pointed out several needed improvements in present construction equipment to be used in railroad maintenance. Chief among these is the requirement that such equipment be made more mobile since it must be used at constantly changing and usually isolated locations where repair facilities are not available. It should be more rugged since close supervision of its operation is difficult. Also, it should be designed so that any part may be repaired or replaced on the job, he said.

Other needed improvements in the design of construction equipment to make it more valuable for railroad purposes, declared Mr. Magee, include an increase in traveling speed for tractors since it frequently is desirable to move these units over considerable distances under their own power. Cranes should be equipped with a suitable magnet for handling materials. These magnets should have a source of electrical power incorporated in the crane, generated by an auxiliary unit not related to the power supply for operating the crane. A special pickup platform could well be offered for tractors, with front end loaders which could be adapted for handling frog and switch material.

There have been some comparatively new developments in railroad maintenance work which bid fair to utilize construction equipment on a large scale, continued Mr. Magee. Several railroads are quite interested in stabilizing roadbeds by pressure concrete grouting. Crawler type equipment is being used more and more for ditching and roadbed widening. In this work several tractors and carryalls often are used together, operating through cuts in single file, each taking a slight cut throughout the length of the ditch and depositing the material on the adjoining fill where it is further distributed with a bulldozer, he said.

Airport maintenance

Neither equipment distributors nor manufacturers can afford to overlook the part they will play in our proposed billion-dollar national airport program, declared Lowell H. Swenson, manager, National Aeronautic Association, Washington, D. C. This program contemplates the construction of 3,050 new airports and the improvement of 1,625 existing ones which, together with 1,630 present approved airports will make a total of 6,305 airports of all classes throughout this country (*ENR*, Dec. 7, 1944, vol. p. 725).

Nearly 90 percent of the money to be spent in this national airport plan will be expended for preparation of sites and for grading, said Mr. Swenson. A breakdown of this figure discloses that $525,300,000 will be needed for site-preparation; $395,305,000 for paving of all types; $55,082,000 to illuminate airports for night flying; $34,893,000 of miscellaneous construction and $10,980,000 for radio equipment, he said.

In addition to the large amount of construction equipment required to execute this program after the war, declared Mr. Swenson, increased maintenance equipment will be needed as more airports are completed and put into operation. The amount of this equipment needed to properly maintain the entire 6,305 airports in the national system should be of special interest to manufacturer and distributor alike. This includes: 7,610 pickup trucks; 4,560 trucks of from 2 to 4-ton capacity; 3,000 snow plows; 3,700 pneumatic tired rollers; 1,510 fully equipped electrical and mechanical shops; 6,305 reel-type gang mowers; 1,510 sickle bar mowers; 6,300 tractors; 6,300 rollers weighing from 1 to 2 tons; 6,300 fertilizer spreaders; 1,510 seed drills and 6,300 mechanical hand seeders, he said.

It is difficult to estimate just how much of this equipment already is in the hands of the operators of existing airports, said Mr. Swenson, but it is reasonable to assume that 60 percent of these quantities will actually be purchased since less than one-half of the proposed national airport system has been completed to date.

Evidence of the increased interest being taken in both the manufacture and distribution of construction equipment by members of those industries was clearly indicated by two singular circumstances—attendance at the convention and growth in association membership. This year's attendance of 1,280 manufacturers, distributors and guests exceeded last year's registration by some 300 persons. Membership in A.E.D. has enjoyed a phenomenal growth in the past 4 years, said C. F. Winchester, executive secretary. In 1941 the association's roster included 175 distributors and 75 manufacturers making a total of 250 member companies. The association's total membership now stands at 739, which is made up of 551 distributors and 188 manufacturers, he said.

New officers

H. O. Penn of New York City was elected president of the association succeeding G. W. Van Keppel of Kansas City, Mo. F. B. McBath, Portland, Ore., was named executive vice president, and the two new vice presidents are Hal M. Davis, Houston, Tex., and Geo. N. Beckwith, Pittsburgh, Pa. W. W. Bucher, New York City, was re-elected treasurer, and Carol W. Winchester, Washington, D. C., was renamed executive secretary.

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Westbound Lincoln tube now open for traffic

The 7,484-ft. north tube of the Lincoln Tunnel for one-way westbound traffic under the Hudson River between West 39th St., Manhattan and Weehawken, N. J., was opened Feb. 1.

With the opening of the north tube, the south tube of the Lincoln Tunnel opened Dec., 1937, became a two-lane, one-way eastbound roadway. The Lincoln Tunnel was built and is owned and operated by the Port of New York Authority.

Completion of the north tube at a time when most civil construction has been halted due to priorities on essential materials, was made possible through the recognition of the War Production Board of the necessity for this additional connection for war-essential traffic between New York and New Jersey. During 1944, 46,000 military vehicles used the south tube, and it is estimated that three-quarters of the 5,660,000 buses, trucks and passenger cars carried passengers and material needed in the war effort.

Rivers and Harbors Bill Passed by Senate

A rivers and harbors bill (S. 35) authorizing construction of 291 projects estimated to require a total expenditure of $382,000,000 was passed Jan. 29 by the Senate. The measure appropriates no funds for construction. Moreover, it contains a provision prohibiting an appropriation for any authorized work until six months after the war emergency is ended, unless certain projects are found to be of value to the war effort. However, if the bill becomes a law, which requires approval by the House and the President, it will permit much additional postwar planning by the Corps of Engineers.

The bill authorizes eight projects, each costing over $10,000,000. These are: improvement of the Intercoastal Waterway from Jacksonville to Miami, Fla., $11,789,000; a navigation and power development in the Alabama-Coosa River basin in Alabama, $60,000,000; navigation and power projects on the Neches and Angelina rivers in Texas, $23,000,000; similar construction on the Trinity River and its tributaries in Texas, $15,00,000; construction of a Mississippi River lock at Chain of Rocks above St. Louis, Mo., $10,290,000; improvement of the Illinois Waterway, Illinois, and Indiana Harbor and Canal, Indiana, $25,900,000; construction of a series of locks and dams to improve navigation on the Snake River in the Pacific northwest, $58,625,000; and construction of McNary Dam, formerly designated Umatilla Dam, on the Columbia River for navigation and power, $49,470,000. In addition, 283 projects all costing less than $10,000,000 are authorized.

The bill as passed by the Senate differs widely from the bill (H. R. 3961) passed by the House during the last session of Congress. Five major controversial items have been eliminated. These are: a $66,000,000 waterway connecting the Tombigbee and Tennessee rivers, construction of a 12-ft. channel on the Beaver-Mahoning rivers below Youngstown, Ohio, at a cost of $38,500,000; a $25,000,000 project providing for improvement of the Savannah River and construction of the Clark Hill reservoir in Georgia; a $25,000,000 improvement on the Santee-Congaree rivers in North Carolina and improvements on Missouri River. The latter construction, plus the Savannah river work, including the Clark Hill Dam, are contained in the Flood-Control Law (Public Law 534) passed by the last Congress. Also missing from the bill as passed this week by the Senate is a highly controversial provision exempting the Central Valley project in California from the limit on the size of tract under individual ownership that is in the Reclamation Act. It was this feature which blocked passage of the bill by the last Congress.

A bill (H. R. 1577) similar to that passed by the Senate has already been introduced in the House. If the bill is made law it will be the first rivers and harbors authorization act passed since 1938. It is interesting to note that the present backlog of rivers and harbors improvements consists of only 69 projects, involving an estimated total cost of about $170,000,000.

MEETINGS

National

THE ENGINEERING INSTITUTE OF CANADA, 59th annual general and professional meeting. Winnipeg, Man., Feb. 7-9.

Regional and Local

IOWA SECTION, AMERICAN SOCIETY OF CIVIL ENGINEERS, midwinter meeting, Des Moines, Ia., Feb. 6.

TEXAS WATER WORKS AND SEWERAGE SHORT SCHOOL, 27 annual meeting, College Station, Tex., Feb. 5-7.

IOWA ENGINEERING SOCIETY, 56th annual meeting, Hotel Ft. Des Moines, Des Moines, Iowa, Feb. 6-7.

ILLINOIS HIGHWAY ENGINEERS AND COUNTY HIGHWAY SUPERINTENDENTS, annual conference, at University of Illinois, Urbana, Feb. 14-16.

OHIO SOCIETY OF PROFESSIONAL ENGINEERS, annual convention, Deshler-Wallick Hotel, Columbus, Ohio, Feb. 15-16.

ONTARIO GOOD ROADS ASSOCIATION, annual convention, Royal York Hotel, Toronto, Canada, Feb. 28-March 1.

Cancellations

WISCONSIN CONSTRUCTORS AND WISCONSIN CHAPTER, A.G.C., Oshkosh, Feb. 13-14.

SOUTHEASTERN ASSOCIATION OF STATE HIGHWAY OFFICIALS, Birmingham, Ala., Feb. 21-22.

ARKANSAS ENGINEER CLUB, Little Rock, Feb. 23-24.

MISSISSIPPI VALLEY CONFERENCE OF HIGHWAY OFFICIALS, Chicago, Ill., Mar. 1-3.

Young, chief engineer, Bureau of Reclamation

Walker R. Young, for four years assistant chief engineer of the Bureau of Reclamation and acting chief engineer since the retirement of S. O. Harper last December, has been appointed chief engineer of the bureau.

Walker R. Young

Mr. Young was graduated from the University of Idaho in 1908 as a mining engineer, where in 1935 an honorary degree of doctor of engineering was conferred upon him. After graduation he worked for the Idaho State Engineering Department on the development of Carey Act irrigation projects in Idaho. On July 1, 1911, he joined the Bureau of Reclamation as an instrument man on the construction of Arrowrock Dam in Idaho, the highest dam in the world at that time. Soon after he was transferred to the project designing department, of which he was put in charge in 1914. In 1916 he moved to Denver, Colo., where he headed the mechanical and dams design division.

From 1920 to 1930, Mr. Young had charge of investigations, designs and estimates of Boulder Dam, the Iron Canyon project, the proposed Salt Water Barrier to transform the upper San Francisco Bay system into a fresh water lake, and the Kittitas Division of the Yakima project. He then returned to the Boulder Canyon Project as construction engineer on Boulder Dam, power plant and appurtenant works.

In May 1930, following the completion of Boulder Dam, Mr. Young was transferred to the Central Valley project in California as supervising engineer. After Chief Engineer Walter's death in 1940, and the advancement of Mr. Harper from assistant chief engineer, Mr. Young was transferred from the Central Valley project to the Denver office as assistant chief engineer.

A.S.C.E. technical papers

(*Continued from page 5*)

girders by making $t = 5I_y/b^3$, where I_y is the moment of inertia of the girder about its vertical axis.

Following a somewhat similar technique of investigation. Roland G. Sturm of Purdue University, analyzed the problem of shear buckling and stability of thin shells in torsion. Buckling of members accompanied by creep was discussed by Joseph Marin, professor of engineering mechanics, Pennsylvania State College.

Industries and cities

At a joint session with the American Institute of Planners, the city planning division of the society heard Charles P. Wood, industrial engineer of Lockwood Greene Engineers, New York City, outline some of the factors controlling the location of various types of industry. Stating that small manufacturers will probably migrate during the postwar era to follow shifting markets, labor and transportation facilities, Mr. Wood pointed out that to attract these "transient" industrial tenants it would be necessary to provide them with adequate flexible service facilities in buildings scientifically situated and designed to meet the changing requirements.

Homer Hoyt, director of economic studies for the Regional Plan Association, New York City, discussed the economic basis for planning the postwar industries of the New York metropolitan region. He said that present birth and death rates, together with limited immigration, indicate a static population of 15,500,000 will be reached in this area between 1965 and 1970, and that industries and the attendant services must be planned on that basis.

"Our goal", he continued, "should be to strengthen the economic base of a city to perpetuate and renew itself, thus making it not only a more livable city but also a more efficient place to work."

Postwar highways

Figures indicating that a large amount of postwar highway planning that has reached the stage where actual construction can be put underway when restrictions on new construction are lifted were reported to the highway division meeting by Hal H. Hale, executive secretary, American Association of State Highway Officials, in a survey of the status of postwar highway planning.

Mr. Hale laid special emphasis on the part played by highway construction in the national economy. A survey of construction in the years 1920-1940 indicated, he said, that highways made up about half of the public construction and about one-third of all construction.

Lessons to be learned from past experience in designing express highways for metropolitan regions were discussed by Joseph Barnett, chief of the Urban Road Division of the Public Roads Administration. Failure to acquire adequate right-of-way, Mr. Barnett said, is one of the outstanding defects of earlier express highway planning.

In discussion, Harry W. Lochner, Chicago, cited the potential values that can be created by making parks or playgrounds out of excess land that must frequently be acquired in obtaining rights-of-way for express highways through metropolitan regions.

Various aspects of soil research and current foundation studies were reported at two sessions of the soil mechanics and foundations division. Included were papers on accelerated consolidation of soils by means of sand drains, by O. J. Porter of the California Division of Highways; building foundations on compressible soils, by Raymond E. Means, associate professor of architecture at Texas A. & M. College; stress-strain characteristics of compacted soil systems, by Joseph B. Eustis of the U. S. Waterways Experiment Station at Vicksburg; and a report by J. O. Osterberg, Northwestern University, on the field and laboratory testing of soil bearing values being carried out under the sponsorship of Engineering Foundation.

JOBS OF THE WEEK

ORDNANCE PLANT ADDITION, Talladega, Ala.

Brecon Loading Co., Talladega, operator, awarded a contract for Coosa River Ordnance plant addition to Henderson, Black & Greene Co., Troy, Ohio, at an estimated cost of $2,500,000. J. W. Goodwin Engineering Co., Birmingham, Ala., is the engineer.

DWELLINGS, Salt Lake City, Utah.

W. E. Robertson Co., Los Angeles, Calif., will construct a Club Village, including 240 dwellings, by own forces. The estimated cost is $1,500,000. Slack W. Winburn, Salt Lake City is the architect.

SHELL PLANT, Pittsburgh, Pa.

Jones & Laughlin Steel Corp., Pittsburgh, Pa., will construct a shell plant, to cost about $1,000,000. Rust Engineering Co., Pittsburgh, Pa. is the contractor. C. W. Littler, Pittsburgh, is the chief engineer.

SYNTHETIC TIRE PLANT, Tuscaloosa, Ala.

Austin Co., Cleveland, Ohio, has been awarded an architect-engineer-management contract for a synthetic tire plant to cost $14,000,000 with equipment. B. F. Goodrich Co., Akron, is the operator. Defense Plant Corp. holds title and will finance.

BRIDGE, St. Rose, Que.

Dufresne Engineering Co., Ltd., Montreal, Que., has been awarded a contract for replacing bridge with 1,600-ft. continuous girder bridge, 13 piers, 2 abutments, 4-lane roadway over Riviere des Milles Iles, by Province of Quebec, Quebec. The estimated cost is $1,000,000. Baulne & Leonard, Montreal and Olivier Des Jardins, Dept. of Public Works, Quebec, are the engineers.

IMPROVING AIRPORT, Tucson, Ariz.

U. S. Engineers, Los Angeles, Calif., received the lowest bid for improving airport, from Basich Brothers Construction Co., Alhambra, Calif., $942,815.

SEWER AND DRAINAGE WORK, Corpus Christi, Tex.

The city awarded a contract for constructing sewer, drainage and bay front work to Brown & Root, Houston, at $1,138,348. Myers & Noyes, Corpus Christi, are the engineers.

PLANT, Plymouth, N. C.

Charles F. Rohleder, Philadelphia, Pa., has been awarded a contract by North Carolina Pulp Co., Plymouth, to build a manufacturing plant addition and recovery and evaporation building at an estimated cost of $800,000-$1,000,000 including equipment. Carson & Carson, Philadelphia, Pa., are the engineers. M. J. Polk, Plymouth, is the plant engineer. The company is a division of Klieckhefer Container Co., Camden, N. J.

Note—Additional bidding and contract news on many projects large and small appear in the Construction News section beginning on page 14.

OBITUARY

Maj. John S. Berger, Jr., bridge ngineer and an officer at the New rk Port of Embarkation was killed the crash of a plane at Burbank, lif., recently. Major Berger, who s chief of the planning and construcn branch of the Port Supply and cilities division, was en route to the cific theater. He had seen service Europe. A graduate of Manhattan llege, in civilian life he had spelized in bridge engineering. He was gineer for Madigan & Hyland, New rk, on the Whitestone Bridge project, d before that had been chief inector of cables for the Roebling Co. the construction of the Golden Gate idge at San Francisco.

Mike Haase, 64, died recently in ansas City, Mo. He had been enaged in highway and railway conruction in Missouri and Kansas for e last 40 years.

Calvin N. Krosch, 53, county engier of Martin County, Minn., died his home in Fairmont recently.

Thomas C. Irwin, 75, Fresno, Calif., eneral contractor and builder, died n. 25. Head of a contracting firm earing his name since 1911, Mr. Irin was a former president of the resno Builders Exchange.

E. Clarence Reed, 65, a former dirctor of public works for St. Petersurg, Fla., died there Jan. 14.

Joseph L. Weaver, 79, a retired conractor of Birmingham, Ala., died there Jan. 18.

Joseph G. Bramer, 65, in the conruction business for 40 years at pringfield, Mo., died there recently.

Walter C. Chaffee, 69, engineer and esigner, died in Detroit, Mich., Jan. 20. member of the firm of Bonnah & haffee, he was a graduate of Massahusetts Institute of Technology.

1st Lieut. Knox P. McGiboney of reensboro, N. C., was killed in action France Jan. 5 while serving with a ombat Engineer regiment attached to e Seventh Army. He was an alumnus the University of Tennessee, where e received his civil engineering edution.

Edmund A. Close, 54, a civil engineer ho retired from the New York State Department of Public Works two years ago, died in Rochester, Jan. 18. Mr. Close had been with the state for 35 years. He received his engineering education at the University of Michigan.

W. Bowman Myers, county engineer of Boyle County, Ky., died at Danville, Ky., on Jan. 12.

Clifford M. Stegner, 67, former Cincinnati building commissioner for 16 years, died Jan. 18. He was past president of the Building Officials Conference.

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Perry T. Ford, Ohio Director of Highways

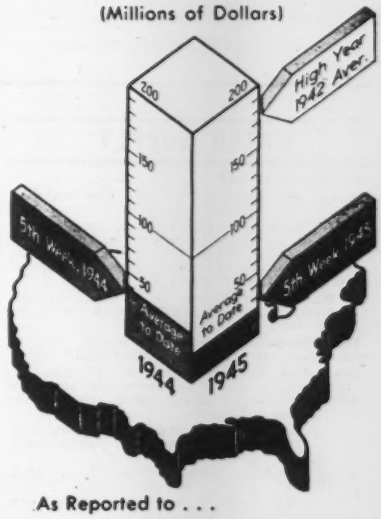
Perry T. Ford, Columbus, secretary of the Ohio engineers' registration board, has been appointed director of state highways by Gov. Frank J. Lausche.

Mr. Ford served as divisional engineer in the state highway department during the administration of Gov. James M. Cox a quarter of a century ago. Later he was chief engineer of the Pan-American Engineering Co., and spent eight months in Cuba supervising government construction projects. He was graduated from Ohio Northern University, and later received an honorary degree from the University of Dayton. He has a special license to practice in France. He became vice president of the National Council of State Boards of Engineering Examiners in 1935. He was president of the Ohio Society of Professional Engineers in 1937-38, and is the founder of "Engineering Age," professional publication of the Ohio Society. He is also past president of the National Society of Professional Engineers.

Initial payment of $75,265 to the U. S. Bureau of Reclamation on the Ogden River project in Utah was made recently by the Ogden River Water Users Association on its repayment contract. The total amount of the obligation has not been determined since the association is attempting to negotiate an amended contract for more lenient terms. Included in the project, which irrigates Weber and Box Elder counties, are Pine View Dam, Ogden-Brigham Canal and South Ogden Canal.

CONSTRUCTION ACTIVITY THIS WEEK

(Millions of Dollars)



As Reported to . . .
Engineering News-Record

CONTRACT VOLUME

Continental U. S. Only
(Thousands of Dollars)

	Week of Feb. 1 1945	Cumulative 1945 (5 wk.)	Cumulative 1944 (5 wk.)
Federal	$18,996	$60,117	$138,954
State & Municipal	2,317	17,027	9,351
Total Public	$21,313	$77,144	$148,305
Total Private	7,403	39,765	43,736
U. S. Total	**$28,716**	**$116,909**	**$192,041**

WHERE CONSTRUCTION ACTIVITY ORIGINATED THIS WEEK

Type of Work	Dollar Volume (Thousands) This Week	Cumulative 1945 (5 wk.)	Cumulative 1944 (5 wk.)
Waterworks	$675	$4,133	$2,092
Sewerage	1,714	3,952	2,310
Bridges	512	4,158	1,818
Highways	179	8,326	6,033
Earthwork, Waterways	106	1,298	3,516
Buildings, Public	12,319	35,966	99,773
Industrial	3,637	28,360	18,146
Commercial	2,977	5,590	22,857
Unclassified	6,597	24,926	34,396

NOTE: Minimum size projects included are: Waterworks and waterways projects, $15,000; other public works, $25,000; industrial buildings, $40,000; other buildings, $150,000.

NEW PRODUCTIVE CAPITAL

	Cumulative 1945 (5 wk.)	Cumulative 1944 (5 wk.)
NON-FEDERAL	$107,734	$58,758
Corporate Securities	5,420	47,176
State and Municipal	102,314	6,005
RFC Loans	.....	5,575
FEDERAL	$77,137	$90,333
Total Capital	**$184,871**	**$149,588**

ENR INDEX NUMBERS

Index Base = 100		1913	1926
Construction Cost	Jan. '45	302.50	145.41
Building Cost	Jan. '45	236.51	127.85
Volume	Dec. '44	66	29

CONSTRUCTION REPORTS

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

ELSIE EAVES, Manager *SCOTT McLEOD, Statistics* *J. A. MAHONEY, Reports*

(Daily service also available—Write for details)

WATER SUPPLY

PROPOSED WORK

Mont., Helena—City, V. N. Kessler, clk., addnl. well. $15,000.

N. C., Raleigh—City, G. Andrews, mayor, purchased property on which Lake Raleigh is located and plans impounding dam increasing storage capacity Lake Raleigh. C. L. Barnhardt, city engr.

N. D., Mayville—City, H. N. Kaldor, aud., City Hall, approved $18,000 bond issue, rebuilding dam at filtration plant.

Pa., Columbia—Columbia Water Co., T. Kain, genl. mgr., pump. sta. $50,000.

Tex., San Antonio—City, Water Bd., 106 W. Market St., drilling, developing deep test water (artesian) supply well, Concepcion Park Station. $20,000.

†Tex., Temple—City, water facilities, Tex. 41-708. FWA. $144,000. J. Montgomery, Nalle Bldg., Austin, engr.

Wash., Bellevue—Water Dist. 68, c/o Parker & Hill, engrs., Smith Tower, 2 and Yesler Sts., Seattle, Zone 4, water sys. $200,000.

BIDS ASKED

Bids Asked February 8

†Ga., Augusta—U. S. Eng., Post Office Bldg., Savannah, water distr. sys. addns., alterations, Oliver General Hospital, Serial No. OLIV-15-45.

Bids Asked February 21

Wash., Vancouver—City, City Hall, 250,000 gal. steel water tank and tower 107 ft. high, $25,000. Plans deposit $5. M. Ray, City Hall, city engr.

LOW BIDDERS

†Calif., Burbank—City, City Hall, Jan 17, installing 26,000 lin. ft. 6- to 24-in. c.i. pipe, appurtenances, Calif. 4-504-N, from R. A. Watson Co., 5528 Vineland Ave., North Hollywood, $50,500. FWA. CD 5/24—ENR 6/1.

†S. C., Spartanburg—City, F. H. Crews, comr. P. Wks., Jan. 16, WW sys., SC 38-245, from Fiske-Carter Constr. Co., Spartanburg, $56,364. FWA. CD 7/19—ENR 7/27.

Wash., Port Townsend—City, C. F. Christian, clk., City Hall, Jan. 23, replacing 30 in. wood pipeline, from M. Malaspina, 1803 30 Ave. S., Seattle, Zone 44, $73,811. CD 1/15.

CONTRACTS AWARDED

D. C., Wash.—District Comrs., District Bldg., watermains, sewers, vicinity of Mississippi Ave., 13 St. and Trenton Place S.E., to Lee Butler Co., Silver Spring, Md., $16,453.

Fla., Miami Beach—City, City Hall, water imprvs. covering under water pipe, to Powell Bros., Fort Lauderdale, $104,222.

†Ga., Chatham (br. Savannah)—U. S. Eng., Post Office Bldg., Savannah, exten. water distr., sanitary sewerage sys. and deep well pumphouse, Chatham Field, Chat-38-45, to J. B. McCrary Co., 22 Marietta St. Bl., Atlanta, $16,512; construction and completion limestone well, Contr. W-09-133-eng-557, to Layne-Atlantic Co., Cromwell Rd. and Flanders Ave., Norfolk, Va., $14,738. Bids 1/19.

†Ind., Crane—Yards & Docks, Navy Dpt., 18 St. and Constitution Ave. N.W., Wash. 25, D. C., furnishing, installing two 100,000 gal. water storage tanks, NOY 11503, to Pittsburgh-Des Moines Steel Co., 38 S. Dearborn St., Chicago, Ill., $41,060.

O., Cleveland—City, E. J. Crown, dir. P. Utilities, City Hall, concrete foundation work and piping for pump installations, Kirtland and Division Pump. Stations, to Dravo Corp., 4810 Prospect Ave., $136,000. Bids 12/29. CD 10/31—ENR 11/2.

Tex., San Antonio—City, Water Bd., 106 W. Market St., laying 4- to 6-in. c.i. feeder lines from Avenue B and 8 St. water supply well, force account. $32,000.

†Utah, Helper—City, E. Flaim, city recdr., 2 m.g. rein.-con. covered reservoir, Utah 42-187, N, to F. H. McGraw Co., P. O. Box 269, Salt Lake City, $43,217. FWA. Bids 1/4. CD 12/18—ENR 12/21.

SEWERS, WASTE DISPOSAL

PROPOSED WORK

Minn., Balaton—Village, E. A. Roloff, clk., bond election, probably in February, sewage disposal sys. $35,000. H. A. Davis, 1406 Osceola Ave., St. Paul, engr.

Pa., Aldan—Aldan Boro, Chas. A. Simons, burgess, sewerage treatment works, $75,000. Damon & Foster, Sharon Hill, engrs.

Pa., Altoona—City, Dpt. P. Wks., sewerage treatment works. $350,000. Albright & Friel, 1520 Locust St., Phila., engrs.

Pa., Bethlehem—Dpt. P. Wks., City Hall, sewerage treatment works, $350,000.

Pa., Boothwyn—Upper Chicester Twp., J. Stewart, secy., Boothwyn, sewerage treatment works, in Upper Chicester Twp. $100,000.

Pa., Bridgeport—Bridgeport Boro, E. G. Gear, burgess, sewerage treatment works. $150,000.

Pa., Clifton Heights—Clifton Heights Boro, H. J. McKeaige, burgess, sewerage treatment works, $150,000. Damon & Foster, Sharon Hill, engrs.

Pa., Collegeville—Ursinus College, Collegeville, sewerage treatment works, $75,000.

Pa., Collingdale (br. Darby)—Collingdale Boro, S. L. Neville, burgess, sewerage treatment works, $160,000. Damon & Foster, Sharon Hill, engrs.

Pa., Colwyn—Colwyn Boro, R. M. Johnston, burgess, sewerage treatment works, $50,000. Damon & Foster, Sharon Hill, engrs.

Pa., Conshohocken—Conshohockn Boro, D. Jones, burgess, sewerage treatment works, $200,000.

Symbols and Abbreviations Include:

† Federal Government
★ Project of $500,000 or over
ENR Engineering News-Record
CD Engineering New-Record Construction Daily

Projects—By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger; water supply, earthwork, waterworks, $15,000; other public works, $25,000; industrial buildings, $40,000; other buildings, $150,000.

Classes of Construction

(Name in order of Listing)

Water Supply
Sewers, Waste Disposal
Bridges
Streets & Roads
Earthwork, Waterways
Latin America
Public Buildings
Commercial Buildings
Industrial Buildings
Unclassified

Stages Reported

PROPOSED: (except Streets & Roads): BIDS ASKED (new announcements only. For full calendar, see also preceding issues of ENR);

LOW BIDDERS: On jobs below $500,000 value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: (Except awards to low bidders previously reported in low bidder stage.

Dates shown are of issue in which last previous report was published.

Pa., Darby—Darby Boro, Geo. A. Dillman, burgess, sewerage treatment works, $[illegible], Damon & Foster, Sharon Hill, engrs.

Pa., Darby—Darby Twp., A. Yocum, engr., sewerage treatment works, $80,000. Damon & Foster, Sharon Hill, engrs.

Pa., East Lansdowne (br. Lansdowne)—East Lansdowne Boro, C. W. Speddel, burgess, sewerage treatment works, $[illegible], Damon & Foster, Sharon Hill, engrs.

Pa., Folcroft—Folcroft Boro, J. S. Dow, Jr., burgess, sewerage treatment works, $50,000. Damon & Foster, Sharon Hill, engrs.

Pa., Folsom—Ridley Twp., R. W. Frame, pres. Comrs., Folsom, sewerage treatment works, in Ridley Twp. $175,000. Damon & Foster, Sharon Hill, engrs.

Pa., Glen Olden—Glen Olden Boro, P. J. Brogran, burgess, sewerage treatment works, $125,000. Damon & Foster, Sharon Hill, engrs.

Pa., Haverford—Haverford Twp., A. A. Reiter, pres. Comrs., Brookline, sewerage treatment works, $225,000. Damon & Foster, Sharon Hill, engrs.

Pa., Lansdowne—Lansdowne Boro, J. T. Stewart, burgess, sewerage treatment works, $185,000. Damon & Foster, Sharon Hill, engrs.

Pa., Linwood—Lower Chicester Twp., G. Chew, pres., Linwood, sewerage treatment works, at Lower Chicester Twp. $100,000.

Pa., Marcus Hook—Marcus Hook Boro, W. J. McClure, burgess, sewage treatment works. $150,000.

Pa., Morton—Morton Boro, J. Alfred Bullock, burgess, sewerage treatment works, $50,000. Damon & Foster, Sharon Hill, engrs.

★ **Pa., Norristown**—Norristown Boro, W. R. Hendrickson, burgess, W. H. Rothrock, engr., swerage treatment works. $500,000.

Pa., Northampton—City, sewerage treatment works, $150,000.

Pa., Norwood—Norwood Boro, S. C. Wright, burgess, sewerage treatment works, $100,000. Damon & Foster, Sharon Hill, engrs.

Pa., Phoenixville—Phoenikville Boro, A. H. Tompkins, burgess, sewerage treatment works, $250,000.

Pa., Pottstown—Pottstown Boro, L. P. Sweeney, burgess, sewerage treatment works, $250,000.

Pa., Prospect Park—Prospect Park Boro, W. B. Krause, burgess, sewerage treatment works, $150,000. Damon & Foster, Sharon Hill, engrs.

Pa., Ridley Park—Ridley Park Boro, Wm. J. Stephani, burgess, sewerage treatment works, $100,000. Damon & Foster, Sharon Hill, engrs.

Pa., Royersford—Royersford Boro, S. W. Fox, burgess, sewerage treatment works, $100,000.

Pa., Rutledge—Rutledge Boro, E. Morgan, burgess, sewerage treatment works, $25,000. Damon & Foster, Sharon Hill, engrs.

Pa., Sharon Hill—Sharon Hill Boro, W. M. Duncan, burgess, sewerage treatment works, $120,000. Damon & Foster, Sharon Hill, engrs.

Pa., Spring City—Spring City Boro, R. L. Evens, sewerage treatment works, $100,000.

Pa., Springfield (br. Media)—Springfield Twp., J. W. Calder, Twp. clk., Springfield, Delaware Co., sewerage treatment works, $150,000. Damon & Foster, Sharon Hill, engrs.

Pa., Swarthmore—Swarthmore Boro, J. H. Pitman, burgess, sewerage treatment works, $100,000. Damon & Foster, Sharon Hill, engrs.

Pa., Trainer (mail Marcus Hook)—Trainer Boro, H. Benjamin, burgess, sewage treatment works. $50,000.

Pa., Upper Darby—Upper Darby Twp., J. A. Stucker, pres. Comrs., Municipal Bldg., sewerage treatment works. $300,000. Damon & Foster, Sharon Hill, engrs.

Pa., Wallingford—Nether Providence Twp., T. Jay Sproul, pres., Bowling Green, P.O. Wallingford, sewerage treatment works, Nether Providence Twp. Damon & Foster, Sharon Hill, engrs.

Pa., West Conshohocken (br. Conshohocken)—West Conshohocken Boro, H. F. Mosman, sewerage treatment works. $75,000.

Pa., White Haven—Dpt. P. Wks. City Hall, sewerage treatment works. $100,000.

Pa., Wyomissing — Wyomissing Boro., sewerage treatment works. $150,000. Albright & Friel, 1520 Locust St., Phila., engrs.

SEWERS, etc. (Proposed Work, Cont'd.)

Pa., Yeadon (br. Lansdowne) — Yeadon Boro, F. K. Hartley, burgess, sewerage treatment works. $150,000. Damon & Foster, Baron Hill, engrs.

Wash., Long Beach—City, City Hall, sewerage sys. and treatment plant. $140,000. Parker & Hill, Smith Tower, 2 and Yesler Sts., Seattle, Zone 4, engrs.

Puerto Rico, Cidra—City, plans sanitary sewerage sys. $68,000.

Puerto Rico, Luquillo—City, plans sanitary sewerage sys. $45,000.

BIDS ASKED

Bids Asked About March 1

N. Y., Idlewild—Dpt. Marine & Aviation, Pier A, North River, New York, Zone 4, drainage, separate sys. comprising 100,000 lin. ft. 10- to 72-in. pipe, appurtenances. $1,500,000.

LOW BIDDERS

D. C., Wash. — District Comrs., District Bldg., Jan. 25, East Hills sewers and waterlines, vicinity 46 and B Sts. S.E., from E. Nance Arlington, Va., **$31,035; Luzon** Valley storm water sewers, vicinity 46 and Underwood Sts. N.W., from Nickles Bros., Wyattsville, Md., **$28,145.**

Md., Baltimore—City, Bd. Awards, City Hall, Jan. 19, Sanitary Contr. 361, furnishing, installing 2 vacuum filters, 1 vacuum pump, 1 sludge pump, 1 low pressure blower, miscellaneous mechanical and electrical equip. at Back River Sewage Disposal Works, Contr. 361, from Bass Engrg. & Constr. Co., 15 Birmingham Theatre Bldg., Birmingham, Ala., **$77,840.**

CONTRACTS AWARDED

Ala., Mountain Brook — City, City Hall, sanitary sewerage sys. St., to Loftis Utility Constr. Co., 45 Mangum S.W., Atlanta, Ga., **$21,895.** Bids 1/15. CD 12/13—ENR 12/21.

Calif., Whittier—City, City Hall, sewage disposal plant imprvs., aeration tank and primary clarifier, secondary clarifier, alter cutoff tanks, alter pumphouse, new control house, electric motor control, new sludge beds, yard piping, miscellaneous concrete work, force account. Approx. **$90,000.** Bids Jan. 22 rejected.

D. C., Wash. — District Comrs., District Bldg., sewers, watermains, vicinity East Capital St., Benning Rd., 47 and 49 Sts., to Intercounty Constr. Corp., Hyattsville, Md., **$38,417.** Bids 1/14.

†Tex., Bay City — City, S. E. Doughtie, mayor, City Hall, 2 lift stations, disposal plant addns., alterations, etc., existing Tex. 11-702-N, Contr. 3, to Knutson Construction Co., Commerce Bldg., Houston, **$179,029.** EWA. S. A. Russell, Bay City, engr. CD 1/16—ENR 1/18.

Tex., Corpus Christi—City, A. C. McCaughan, mayor, City Hall, sewer and drainage work, Bay front work, high water protective works and 2 large pump houses, to Brown & Root, P.O. Box 3, Houston, **$1,158,348.** Bids 1/11. CD 1/16—ENR 1/18, under LB.

BRIDGES

PROPOSED WORK

†California—Yards & Docks, Navy Dpt., 18 St. and Constitution Ave. N. W., Wash. 25, D. C., preparing plans bridge across Cerritos Channel, connecting Terminal Island with mainland, and access road. $14,000,000.

Mass., East Boston and Chelsea—City of Boston, Bridge Div., City Hall Annex, Boston, making plans bridge between Chelsea and East Boston. $2,000,000.

N. C., Raleigh—Seaboard Air Line Ry., Seaboard Bldg., Norfolk, Va., rejected bids Dec. 5, bridge over Crabtree Creek. $90,000-$100,000. CD 11/30.

Oregon—State Hy. Comn., T. H. Banfield, Secrn., Salem, underpass serving Vanport City at end of Schmeer Rd., in Portland, Multnomah Co. $30,500. R. H. Baldock, state hy. engr.

Wash., Elma—Grays Harbor Co., Court House, Montesano, rebuilding Porter Bridge, near here, using 230 ft. steel span from abandoned bridge. $27,271. J. H. Kirkwood, Court House, engr.

BIDS ASKED

Bids Asked February 7

Louisiana—State Dpt. Hys., Baton Rouge, timber pile trestle span bridge 0.025 mi. S.P. 737-00-02, Contr. 4, Defense Access Army Reservation, Proj. DA-WR-500 (1), Natchitoches Parish.

Louisiana—State Dpt. Hys., Baton Rouge, repairing Bayou Grosse Tete Bridge at Indian Village State Route 65; rebuilding pivot pier, tender sys. and East Rest Pier; replacing 4 of the East approach trestle spans with three 19 ft. trestle spans; redecking 178 ft. swing span, 16 ft. East approach trestle span, 14 ft. West approach trestle span, etc. in connection therewith, Iberville Parish. Plans deposit $2.

Bids Asked February 8

California—State Div. Hys., State Bldg., Los Angeles, rein.-con. overhead crossing with asphaltic concrete pavement and plant mix surfacing, Los Angeles Co. G. T. McCoy, P. Wks. Bldg., Sacramento, state hy. engr.

LOW BIDDERS

Ga., Decatur—De Kalb Co., Decatur, and Fulton Co., Atlanta, Jan. 15, bridge over car tracks, 2 Ave., from E. H. Hines, Greenwood, S. C., **$35,250.**

Illinois—State Div. Hys., Springfield, Jan. 26, imprv. bridge, Peoria and Tazewell Counties, from Zimmerly Constr. Co., Paris, **$134,226.** CD 1/17.

O., Cleveland—City, S. F. David, dir. P. Service, City Hall, Jan. 12, repairing Clark Ave. Bridge, from Vogt & Conant, 1504 E. 40 St., **$305,730.** CD 12/7.

CONTRACTS AWARDED

Que., St. Rose—Provincial Govt., Quebec City, 1,600 ft. bridge, 4 lane, 42 ft. wide, with 5 ft. sidewalks, 13 piers, 2 abutments, rein.-con. roadway over Riviere des Millies Isles, to Dufresne Engineering Co., Ltd., 1832 Pie IX, Blvd. Montreal. Est. **$1,000,000.** Baulne & Leonard, 354 E. Ste. Catherine St., Montreal, associated with Olivier Desjardins, Dpt. P. Wks., Quebec City, engrs. CD 10/5—ENR 10/12.

STREETS AND ROADS

PROPOSED WORK

Puerto Rico—Cities and towns, plan reconstructing streets throughout all towns and cities, island wide. $1,000,000.

BIDS ASKED

Bids Asked February 6

Iowa—State Hy. Comn., Ames, maintenance resurfacing 3.9 mi. Iowa 165 from Onawa to State Park, 22.6 mi. Iowa 35 from Iowa 37 to Ida Co., 9.1 mi. Iowa 37 from Iowa 35 to end of oil, 4.2 mi. Iowa 31 from Smithland to Oto, 15.6 mi. Iowa 140 from Sloan to Climbing Hill, M-3320, Monona and Woodbury Counties; 19.55 mi. Iowa 31 from Oto to Ida Co., M-3324, Woodbury Co. F. R. White, ch. engr.

Bids Asked February 7

Louisiana—State Dpt. Hys., Baton Rouge, furnishing, del. 16,310 cu. yd. sand clay gravel f.o.b. railroad cars, various sidings S.P. 703-01-01, Caddo Parish, CD 1/9—ENR 1/11; grading, surfacing 1.573 mi. Lopez Levee Set-Back Hy., State Route C-1473, East Baton Rouge Parish; plans deposit $5 with cross sections $2.50 without cross sections; bituminous surface treatment, etc. 1.452 mi. Angelina Levee Set-Back Hy., State Route 1, St. John Baptist Parish. Plans deposit $6 with cross sections, $3 without cross sections.

Bids Asked February 8

Ont., Orangeville—F. M. Eagleson, engr., Orangeville, crushing, hauling approx. 70,000 cu. yd. gravel, for Dufferin Co. About $100,000.

Bids Asked February 12

Ont., Cobourg—A. S. Miller, engr., Cobourg, crushing 14,000 cu. yd. gravel to ¾ ins. for United Counties of Northumberland and Durham, Cobourg. $25,000.

LOW BIDDERS

Louisiana—State Hy. Dpt., Baton Rouge, Jan. 24, imprv. 0.035 mi. Iberia Parish, from A. M. Mutersbaugh, Lake Charles. **$36,638.** CD 1/9—ENR 1/11.

Tex., Corpus Christi—City, A. C. McCaughan, mayor, City Hall, resurfacing permanent paving South Staples St., from 6 points to the Tex.-Mec. R. R. (Kinney Ave.), from Brown & Root, Inc., 1501 Musset St., Corpus Christi, **$40,635.**

CONTRACTS AWARDED

Alabama—State Hy. Dpt., Montgomery, imprv. 6.252 mi. Coosa Co., to Memphis Stone & Gravel Co., Exchange Bldg., Memphis, Tenn. **$56,589.** Bids 1/19. CD 1/9—ENR 1/11.

†Pa., Mechanicsburg — Yards & Docks, Navy Dpt., 18 St. and Constitution Ave. N.W., Wash. 25, D. C., roads, tracks, facilities, Naval Supply Depot, NOY 11754, to **Gravell & Minick, 112 W. Main St.**

EARTHWORK, WATERWAYS

PROPOSED WORK

N. J., Cape May—City Clerk, City Hall, new jetties and bulkheads, reconstructing facilities. $300,000.

BIDS ASKED

Bids Asked After February 1

†Tex., Galveston—U. S. Eng., 25 St. and Avenue F, furnishing, installing addnl. protection to guard timbers on gates at Brazos and Colorado Floodgates of Louisiana-Texas Intracoastal Waterway; Brazos River Proj. includes approx. 7,200 ft. 10 x 10 in. structural timber creosoted, 2,200 lb. struct. steel and 600 lb. miscellaneous bolts and washers. Colorado project includes approx. 5,400 bd. ft. 10 x 10 in. structural timber, creosoted, 1,100 lb. structural steel and 420 lb. bolts and washers.

Bids Asked February 13

†N. M., Tucumcari—Bureau Reclamation, Dpt. Interior, H. W. Bashore, comr., Tucumcari, structures for Bell, Elliot, Roberts, State, Jack County, Liberty, Young, Coulter, Hurley and Bend laterals and sublaterals, 2 to 4 mi. north and west of here, Spec. 1093.

Bids Asked February 15

†Oregon — Bureau Reclamation, Court House, Denver, Colo., furnishing, del. f.o.b. cars shipping point or Redmond, two 8 ft. x 11 ft. radial gates with manually operated radial-gate hoists for installation in waterway at station 2021 plus 37; one 10x7 ft. radial gate with manually operated radial-gate hoist for installation in M-37 turnout at station 2021 plus 37; one 10x8 ft. radial gate with manually operated radial-gate hoist for installation in turnout lateral M-43 at station 2376 plus 60, Deschutes Project, Spec. 1792-D. Plans deposit $25.

CONTRACTS AWARDED

†Calif., Pt. Molate (Richmond)—Yards & Docks, Navy Dpt., 18 St. and Constitution Ave. N.W., Wash. 25, D. C., maintenance dredging, Naval Fuel Annex, NOY 11535, to Olympian Dredging Co., 525 Market St., San Francisco, Zone 5.

†Kan., Wichita—U. S. Eng., 416 Wright Bldg., Tulsa 2, Okla., dredging, grading, rip-rapping, placing rock in river bed along Little River, to Dean S. Dodgden Constr. Co., Enid, Okla., **$91,000.** CD 1/16—ENR 1/18.

O., Cleveland—Erie R.R. Co., J. W. Smith, ch. engr., Midland Bldg., Zone 15, reconstructing 400 ft. steel sheet piling bulkhead along Cuyahoga River, to Great Lakes Dredge & Dock Co., Williamson Bldg. Est. **$60,250.** CD 1/9—ENR 1/11.

†R. I., Prudence Island (Portsmouth)—Yards & Docks, Navy Dpt., 18 St. and Constitution Ave. N.W., Wash. 25, D. C., riprapping protection work, NOY, 11293 to Calain Constr. Corp., 539 Hope St., Bristol, **$29,000.** Bids 12/12. CD 12/8.

LATIN AMERICA

Ecuador, Guayaquil—City, plans baseball park. Osborn Engrg. Co., engr., 7016 Euclid St., Cleveland, O., U.S.A., drawing plans.

Mexico—State of Durango, Governor Blas Corral Martinez, Durango, will construct road between Lerdo and Durango, by own forces. **$100,000.**

Mexico, Culiacan—State of Sinaloa Govt., Palacio del Estado, Culiacan, plans building, reconditioning 104 public schools. $415,000. Prof. Enrique Felix, dir. P. Educ., Sinaloa.

Mexico, Durango—State of Durango, Governor Blas Corral Martinez, Durango, plans repairing school houses throughout state. $125,000.

Mexico, Mexico City—Cemento Portland Blanco de Mexico, S.A., Motolinia, 25-202, Mexico, D.F., plans white portland cement mfg. plant, $250,000; Quimica Electrolitica, S.A., Calzada Puerto Aereo, 103, Mexico, D.F., plans electrolitic chlorate of potassium plant, $125,000; Machetes y Cuchillos, S.A., V. Carranza, 48-408, Mexico, D.F., plans metallic table cutlery plant, $100,000; La Union, S.A., I. la Catolica, 13-207, plans hand lamp mfg. plant, $100,000.

Mexico, Mexico City—Dr. Gustavo Baz, health secy., Monda and Palacio National St., takes bids within 100 days, Hospital of Jesus hospital-sanitarium. $450,000.

Mexico, Oaxaca—State Oaxaca, Gen. Edmundo Sanches, spokesman for Goovernor's Office, Oaxaca, takes bids in February, constructing schools throughout the state. $500,000.

Mexico, Sabinas—State, Capital City, Puchuca, Gov. Jose Lugo Guerrero, takes bids within 90 days, water sys., $100,000.

PUBLIC BUILDINGS

PROPOSED WORK

†Calif., San Francisco — Pub. Housing Auth., NHA, Phelan Bldg., 760 Market St., 1,000 unit family dwellings, Calif. 4930.

†Calif., San Pedro—Yards & Docks, Navy Dpt., 18 St. and Constitution Ave. N.W., Wash., 25, D. C., housing. $500,000.

†Calif., San Pedro—Yards & Docks, Navy Dpt., 18 St. and Constitution Ave. N.W., Wash. 25, D. C., preparing plans, permanent Naval Supply Depot. $5,000,000. CD 4/14—ENR 4/27.

†Calif., Stockton—Pub. Housing Auth., NHA, Phelan Bldg., 760 Market St., San

PUBLIC BLDGS. (Proposed Work, Cont'd.)

Francisco, 1200 unit family dwellings, Calif. 4978; 225 unit dormitory housing, Calif. 4979; 50 unit family dwellings Calif. 4981.

★**†Calif., Torrance**—Yards & Docks, Navy Dpt., 18 St. and Constitution Ave. N.W., Wash. 25, D. C., preparing plans material redistribution and disposal center. $1,820,000. CD 8/23.

★**†Conn., Newington** — Veterans Admin., Vermont Ave. between H and I Sts. N.W., Wash. 25, D. C., brick, steel, concrete hospital addn. $750,000.

†D. C., Wash.—U. S. Eng., 1 and Douglas Sts. N.W., Wash., Zone 25, mess hall, alteration, addn., Walter Reed General Hospital, $150,000.

†Idaho, Pocatello—Pub. Housing Auth., NHA, Skinner Bldg., 5 Ave. and Union St., Seattle 1, Wash., plans by McClelland & Jones, Republic Bldg., 2 and Pike Sts., Seattle 1, Wash., and F. Paradice, Pocatello, 80 unit family housing, Idaho 10119. $200,000. CD 1/23—ENR 1/25.

†Ill., Great Lakes—Yards & Docks, Navy Dpt., 18 St. and Constitution Ave. N.W., Wash. 25, D. C., engineer-architect services by Sargent & Lundy, 140 S. Dearborn St., Chicago, laboratory, Naval Training Centre.

Ind., Anderson—City, 1301 Lincoln St., plans by E. F. Miller, Anderson Bank Bldg., junior high and elementary school, 29 St. $400,000. CD 8/31—ENR 9/21, under Post-war Projects.

★**†Ind., Clinton**—U. S. Eng., 520 Merchandise Mart, Chicago, Ill., addnl. bldgs., Wabash River Ordnance Works. $20,000,000.

†Ind., Terre Haute—Merchants Distilling Co., Wabash Ave. at River, dry house with equip. $430,000. Defense Plant Corp. will finance.

†La., New Orleans—U. S. Eng., 25 St. and Avenue F, Galveston, Tex., 1 story, approx. 30 x 75 ft. library and automatic sprinkler sys., at La Garde General Hospital.

†Md., Aberdeen—U. S. Eng., 21 St. and Virginia Ave. N.W., Wash. 25, D. C., preparing plans explosive and receiving bldg.

★**†Md., Bethesda (br. Wash. D. C.)**—Federal Works Agency, 1300 F St. N.W., Wash. 25, D. C., laboratory. $900,000.

Mich., Pontiac — Pontiac State Hospital, Pontiac, hospital addn. $150,000.

Mich., Monroe—City, City Hall, plans by R. M. Dunbar, Monroe, 1 story, concrete, tile storage warehouse. $60,000.

Minn., Austin—City, J. H. Welland, clk., will let contract in March, constructing power plant addn. $487,000. Helmick, Edeskuty & Lutz, 412 Essex Bldg., Minneapolis, engrs.

★**†Miss., Aberdeen**—U. S. Eng., Grant St., west of Westwood St., Mobile, Ala., addnl. bldgs. and modifications existing bldgs., Gulf Ordnance Plant. $4,113,000.

★**Neb., Omaha**—University of Nebraska Hospital, 42 and Dewey Sts., Dr. Chas. W. M. Poynter, supt., hospital addn. $600,000.

★**†N. J., Dover**—U. S. Eng., 120 Wall St., New York 5, N. Y., addnl. bldgs., Picatinny Arsenal. $1,105,000.

†O., Findlay—Pub. Housing Auth., NHA, 2073 E. 9 St., Cleveland, 75 unit trailer housing, Ohio 32307.

★**†O., Ironton**—U. S. Eng., Chesapeake & Ohio Bldg., Huntington, W. Va., increased capacity at Buckeye Ordnance Works. $1,500,000.

Okla., Oklahoma City — Bd. Affairs, sketches by L. H. Bailey, Colcord Bldg., Crippled Children's Hospital addn. $175,000.

Okla., Ponca City—City, C. E. Norton, clk., City Hall, voted bonds, municipal hospital addn. $150,000. L. Senter, Philtower Bldg., Tulsa, archt. CD 12/28—ENR 1/4.

†Ore., Klamath Falls—Pub. Housing Auth., NHA, Skinner Bldg., 5 Ave. and Union St., Seattle 1, Wash., plans by H. Perrin, Klamath Falls, 50 unit family housing, Ore. 35310. CD 1/23—ENR 1/25.

★**†Pa., McKees Rocks**—Continental Can Co., C. D. Conway, pres., Munson Ave., general contract 1 story, 100x220 ft., solid brick mfg. bldg. $750,000. Defense Plant Corp. will finance.

†Tex., Temple — U. S. Eng., Fort Sam Houston, cold storage plant unit, incl. cutting room, machinery, locker and processing rooms, etc., Serial No. 41-154-45-77, $40,000.

★**†Tex., Waco**—General Tire & Rubber Co., 1708 E. Market St., Akron, O., doubling capacity of rubber tire mfg. plant. $1,750,000. Defense Plant Corp. will finance. CD 8/28—ENR 8/31.

★**†Va., Radford**—U. S. Eng., 21 St. and Virginia Ave. N.W., Wash. 25, D. C., ordnance plant addn. $695,000.

†Va., Quantico—Yards & Docks, Navy Dpt., 18 St. and Constitution Ave. N.W., Wash. 25, D. C., architect-engineer services by Edmunds & White, Associated Architects, 409 Calvert Bldg., Baltimore, Md., U. S. Naval Hospital.

★**†Wash., Bremerton**—Pub. Housing Auth., NHA, Skinner Bldg., 5 Ave. and Union St., Seattle, Zone 1, plans by Naramore, Bain, Brady & Johnson, Smith Tower, 2 and Yesler Sts., Seattle, Zone 4, 576 unit temporary dormitory housing. $500,000. CD 1/23—ENR 1/25.

†Wyo., Kemmerer—Bureau of Mines, Dpt. Interior, Interior Bldg., E St. between 18 and 19 Sts. N.W., Wash. 25, D. C., synthetic fuel experimental plant. $75,000.

BIDS ASKED

Bids Asked February 9

†Ore., Portland—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., exten. lobby at U. S. Courthouse, 5 and Morrison Sts., Specs. PB-DE-8.

Bids Asked February 12

La., Haynesville—Claiborne Parish School Bd., Homer, school community food preservation center and vocational agricultural school.

Bids Asked February 13

Minn., Jackson—City, A. E. Wallace, clk., furnishing, installing 2,000 kw. turbine generator, in municipal power plant. Total est. $80,000. (Correction—bid date.) J. B. Harris Co., 702 Wesley Temple Bldg., Minneapolis, engrs. CD 1/3—ENR 1/11.

Bids Asked About February 15

†Calif., Lawndale—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., school, Calif. 4-636-F. **FWA.** H. L. Gogerty Organization, 6355 Yucca St., Hollywood, Zone 28, archts.

Bids Asked About February 19

†Ariz., Phoenix—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., Isaac School addn., Laurel Dist. 5, of Maricopa Co., Ariz. 2-904-1. **FWA.** Lescher & Mahoney, 1100 Title & Trust Bldg., archts.

Bids Asked

†Ill., Forest Park—Amertop Corp., 7500 Roosevelt Rd., 1 story, 40x140 ft., brick, concrete test bldg., for Navy Dpt. Albert Kahn Associated Architects & Engineers, Inc., 345 New Center Bldg., Detroit 2, Mich., archts.

★**†Tex., Sunray**—Continental Carbon Co., 27 Park Pl., New York, N. Y., carbon black mfg. plant. $1,200,000. Defense Plant Corp. will finance. CD 1/17—ENR 1/25.

LOW BIDDERS

Calif., Lakewood Village—Lakewood School Dist., 5021 Centralia Ave., Jan 19, addnl. frame, stucco bldgs. at Lakewood Junior High School, from P. A. Weeger, 4564 Santa Monica Blvd., Los Angeles, $166,200. CD 1/4—ENR 1/11.

†Calif., Pasadena — U. S. Eng., 751 S. Figueroa St., Los Angeles, Zone 14, Jan. 23, 13 bldgs. for jet propulsion laboratory, California Institute of Technology, from Weymouth Crowell Co., 2104 E. 15 St., Los Angeles. $178,888. CD 1/11.

†Md., Baltimore—At office H. P. Hopkins, archt., 10 E. Mulberry St., Jan. 25, 3 story, bsmnt., sub-bsmnt., 2 brick nurses' home, training facilities, Md. 13-207, for West Baltimore General Hospital, Rayner and Dukeland Aves., from Davis Constr. Co., 9 W. Chase St., $279,750. **FWA.** CD 1/4—ENR 1/11.

†Va., Dublin—Pub. Housing Auth., NHA, Georgia Savings Bank Bldg., Peachtree and Broad Sts., Atlanta, Ga., Jan. 12, 150 unit family, portable housing, Va. 44339, from F. H. Wilson, Ardmore, Pa., $323,000. Williams, Colle Pipino, Melson Bldg., Newport News, archts. CD 12/20—ENR 12/28.

Alaska, Anchorage—City, T. E. Downes, clk., City Hall, Jan. 20, 2 story, bsmnt., rein.-con. high school addn., from J. B. Warrack & Co., Securities Bldg., Seattle 1, Wash. $274,000. CD 1/5—ENR 12/7.

CONTRACTS AWARDED

★**†Ala., Talladega**—Brecon Loading Co., operator, Talladega Coosa River Ordnance Plant addn., for U. S. Eng., Grant St., west of Westwood St., Mobile, to Henderson, Black & Greene Co., Troy, $2,500,000. J. W. Goodwin Engrg. Co., Martin Bldg., Birmingham, engr. CD 1/26.

★**†Ala., Tuscaloosa**—B. F. Goodrich Co., 500 S. Main St., Akron, O., A-E-M contract for 300x1,200 ft. synthetic tire plant, to Austin Co., 16112 Euclid St., Cleveland, O., $3,200,000. Total est. $14,000,000, incl. equip. Defense Plant Corp. will finance.

★**Calif., Long Beach**—S. E. Vickers, city mgr., City Hall, natural gas storage tank, Spec. C 644, to Stacy Bros. Gas Constr. Co., 5535 Vine St., Cincinnati, O., $632,000. CD 1/18—ENR 1/25, under LB.

†Calif., Treasure Island—Yards & Docks, Navy Dpt., 18 St. and Constitution Ave. N.W., Wash. 25, D. C., receiving ship barracks addn., NOY 11275, to Dinwiddie Constr. Co., Crocker Bldg., San Francisco, $149,700. CD 9/26.

†Fla., Boca Raton—U. S. Eng., 575 Riverside Ave., Jacksonville, restoring, reconstructing Boca Raton Club property, to John B. Orr, Inc., 25 N E 20 St., and Alexander Orr, Jr., Inc., 218 N E 6 St., both Miami, $207,000.

†Ind., Crane—Yards & Docks, Navy Dpt., 18 St. and Constitution Ave. N.W., Wash. 25, D. C., expan. Lunch and Locker Bldgs. 150 and 170, Naval Ammunition Depot, NOY 11008, to Maxon Constr. Co., Inc., 151 N. Ludlow St., Dayton, O., $225,000. CD 1/19—ENR 1/25.

Mich., Melvindale—Bd. Educ., School Dist., general contract brick, steel, concrete Dashers ward Ave., Detroit. Est. $150,000. Bids 12/20. CD 12/12—ENR 12/14.

†Pa., Mechanicsburg—Yards & Docks, Navy Dpt., 18 St. and Constitution Ave. N.W., Wash. 25, D. C., storage facilities bldgs., imprvs., Naval Supply Depot, NOY 10944, to Earl C. Cump, 251 Park Ave., Chambersburg, $137,499.

★**†Tex., Houston**—Brown & Root, Inc., 4300 Calhoun Rd., plant, moving number of hangars from points in Texas and reconstructing, trackage, gas, sewer, water facilities, concrete fdns. built, etc. Owner builds. $625,000. Defense Plant Corp. will finance. CD 1/3.

COMMERCIAL BUILDINGS

PROPOSED WORK

D. C., Wash.—St. Paul's Episcopal Church, 917 23 St. N.W., plans by P. H. Frohman, Wash. Cathedral Office Bldg., church, K St. N.W., between 24 and 25 Sts.

Ill., Quincy—L. Moncton, Quincy, theatre, 18 and Bway. Sts. Over $150,000.

Ind., Indianapolis—Standard Life Insurance Co. of Indiana, Guaranty Bldg., plans by Skidmore, Owings & Merrill, 100 W. Monroe St., Chicago, Ill., 2 story, bsmnt., limestone, rein.-con. office bldg. $150,000.

Mass., East Boston (br. Boston)—Franciscan Missionaries of Mary, Convent of Our Lady of Good Help, 150 Orient Ave., plans by J. E. Kelley, 71 South Main St., Randolph, hospital for convalescent children, over $150,000.

Mass., Worcester—Garden Housing Co., c/o A. P. Loshen, Jamaica, 108 housing units between Park Ave. and Salisbury Pond, over $150,000.

Minn., Minneapolis—Northwestern Theological Seminary, W. B. Riley, pres., 1020 Harmon Pl., plans by Magney, Tusler & Setter, 202 Foshay Tower, 3 story, bsmnt., brick, rein.-con. seminary, Willow St. and Yale Pl. $200,000. CD 11/3—ENR 11/16.

N. J., Wildwood—Wildwood Ocean Pier Corp., W. C. Hunt, pres., 3505 Atlantic Ave., plans completed by W. H. Lee, 1505 Race St., Phila., Pa., rebuilding theatre and 11 stores. $150,000. C. A. Wolfe, 112 S. 16 St., Phila., Pa., structural engr.

Pa., Lancaster—Methodist Board Western Dist., Dr. Levi H. Zerr, dist. supt., 27 Simpson St., Ardmore, sketches completed by Davis & Dunlap, 1717 Sansome St., Phila., church and sunday school, Grandview Heights. $175,000.

Pa., Phila.—Temple Baptist Church, Rev. Andrew Ruck, pastor and chn. Bldg. Coma. 3527 Judson St., rebuilding church. $150,000-$200,000.

Tex., Abilene—Hendrick Memorial Hospital, c/o E. M. Collier, supt., Abilene, sketches completed by Hughes & Olds, 1514 Cypress St., 3 story, bsmnt., 165x140 ft. nurses home. $160,000.

Wash., Seattle—Medical Security Clinic, Securities Bldg., Zone 1, plans by G. W. Stoddard, Orpheum Bldg., Zone 1, clinic, 8 Ave. and Madison St. $180,000. CD 12/30—ENR 12/28.

CONTRACTS AWARDED

★**Calif., Compton**—Harvey-Adair Constr. Co., 1147 E. Garvey, El Monte, 150 two and three bedroom dwellings, Central Ave. between Imperial and El Segundo Blvd. Owner builds. Approx. $600,000. C. N. Aldrich, 1834 Dawson Ave., Long Beach, archt. J. C. Ellis, 207 W. Valley Bldg., El Monte, engr.

Mich., Hamtramck—Holy Cross Hospital, Sisters of St. Francis, Sylvania, brick, steel, concrete, stone hospital to Spence Bros., 203 Brewer Arcade, Saginaw. $476,700.

N. J., Burlington—Melvin J. Fox, 1015 Chestnut St., Phila., Pa., theatre, to L. Sheffit, 5412 Wyndale Ave., Phila., Pa. $150,000. Awarded 1/12.

New Rochelle, N. Y.—Bd. Governors Rochelle Hospital, Guion Pl., 7 story hospital addn., to Turner Constr. Co., 420 Lexington Ave., New York, Zone 17. Est. $250,000. Shreve, Lamb & Harmon, 11 W. 44 St., New York, Zone 18, archts.

★**Utah, Salt Lake City**—W. E. Robertson Co., 4015 W. Jefferson Blvd., Los Angeles, Calif., 222 brick and 18 frame, stucco dwellings, known as Club Village, Inc. Owner builds. Approx. $1,500,000. S. W. Winburn, 1801 S. 15th St. E., archt.

INDUSTRIAL BUILDINGS

PROPOSED WORK

Ala., Opelika—MILL—Opelika Mills, Div. of M. Snower & Co., Opelika, soon lets contract cotton mill addn., alterations. $325,-

INDUSTRIAL BLDGS. (Proposed Work, Cont'd.)

000. Roberts & Co., **Bona Allen Bldg.**, Atlanta, Ga., engrs. CD 3/31—ENR 4/6.

Conn., Bridgeport—FACTORY—Bridgeport Brass Co., 30 Grand St., brick, steel factory addn., East Main and Walter Sts. Over $40,000. Fletcher Thompson, Inc.. 211 State St., engr.

Conn., Stamford—SALES and SERVICE STATION—Mohawk Service Co., 21 Myrtle Ave., plans by D. Mansell, 24 Park Row, automobile sales and service station, Myrtle Ave. $45,000.

Ga., Atlanta—PLANT—Scripto Mfg. Co., 425 Houston N.S., plans by Robert & Co., Bona Allen Bldg., 2 story, 50x100 ft., steel, brick plant addn.

Ga., Atlanta — WAREHOUSE — Westinghouse Electric & Mfg. Co., 1299 Northside Dr. N.W., plans by Robert & Co., Bona Allen Bldg., warehouse addn., 70x212 ft. cafeteria, 26x100 ft. oil storage bldg., 26x97 ft. new second floor office addn. to present bldg.

Ga., La Grange—MILL—Dixie Cotton Mills, La Grange, plans by Robert & Co., Bona Allen Bldg., Atlanta, 2 story, 30x210 ft. mill addn.

Ga., Rossville—MILL—Peerless Woolen Mills, Rossville, plans by Robert & Co., Bona Allen Bldg., Atlanta, mill addns., alterations.

Ill., Chicago — FACTORY — Illinois Gage Co., 7810 Addison St., plans nearing completion by S. Klefstad, 3600 W. Fullerton St., 1 story, 100x150 ft., brick, concrete, steel factory.

Ind., Lebanon—FACTORY, etc.—Honan Crane Corp., Lebanon, Ind., and 250 Delaware Ave., Buffalo, N. Y., plans completed by G. M. Wolfe, 1377 Main St., Buffalo, N. Y., 2 story, brick factory and office bldg. $100,000.

Ind., Muncie—FOUNDRY PLANT—Magic City Foundries, Muncie, new foundry plant on tract at Ohio Ave. and C. & O. Railway, 198x200 ft. main bldg. $40,000 or more with equip.

Ind., Terre Haute—LABORATORY—Commercial Solvents Co., 1331 S. 1 St., plans by Miller & Yeager, 200 Opera House Bldg., 2 story, basmt., rein.-con., steel laboratory. $300,000.

Mass., Charlestown (Sta. Boston)—STORAGE—Linde Air Products Co., 441 Stuart St., Boston, plans completed brick storage bldg., Charlestown Navy Yard.

Mont., Laurel—POWER PLANT, etc.—Northern Pacific Ry. Co., B. Blum, ch. engr., 176 E. 5 St., St. Paul, Minn., power plant with boiler room, engine room, ash hopper, trackage, piping and water-softening facilities. $393,000.

N. H., Nashua—WAREHOUSE—Nashua Gummed & Coated Paper Co., 44 Franklin St., plans completed by S. Hooper, 199 Washington St., Boston, Mass., and bids in spring, brick, rein.-con. warehouse. $175,000.

★**O., Bellevue**—ROUNDHOUSE TURNTABLE—New York, Chicago & St. Louis R.R. Co., J. C. Wallace, ch. engr., Terminal Tower, Cleveland, Zone 1, roundhouse turntable with 18 stalls, and turntable, 120x140 ft. machine shop, boiler house, etc., relocating westbound yard, incl. facilities for yard engine, etc. $1,600,000.

O., Geneva—FACTORY—Geneva Metal Wheel Co., H. A. Carter, pres., plans by C. V. Martin, 222 Center St., 1 story, 35x200 ft. brick, steel factory addn. $40,000.

O., Hamilton—TERMINAL—Ohio Bus Line Co. c/o Cincinnati Street Railway Co., Dixie Terminal Bldg., Cincinnati, bus terminal.

O., Hillsboro—PLANT—C. S. Bell Co., Hillsboro, 5 prefabricated material foundry plant bldgs., U. S. Rt. 50, 1 mi. west of here.

★**O., Toledo**—PLANT—Doehler-Jarvis Co., Smead Ave., 3 story plant bldg. adjoining present bldg., Smead Ave., at north to West Woodruff Ave., and 1 story plant adjoining present bldg. Smead Ave., south to Oakwood Ave. $600,000.

O., Warren—MILL—Republic Steel Corp., H. McAllister, purch. agt., Republic Bldg., silicon steel strip mill addn. $94,000.

Ore., Portland—PLANT ALTERATIONS—Shofner Iron & Steel Wks., 2770 N.W., Yeon Ave., Zone 10, iron and steel works alterations, addns. $100,000.

Ore., Warm Springs—PLANING MILL, etc.—Warm Springs Lumber Co., Warm Springs, planing mill and sorting shed. $100,000. F. W. Horstkotte, American Bank Bldg., Portland, engr.

Pa., Bristol—GARAGE, etc.—Fleetwings, Inc., c/o Kaiser Cargoes, Inc., H. J. Kaiser, dir., Bristol, garage, $45,000; 4 individual airplane hangars, $50,000.

Pa., Carnegie—WAREHOUSE, etc.—O. O. Hommel Co., J. H. Sylvester, supt., Maple St., bids soon 1 story, 30x120 ft., steel warehouse addn., 1 story, 14x14 ft., brick compressor bldg., 1 story filter bldg. $40,000.

Pa., Erie—GARAGE, etc.—Sanitary Farms Dairy, Inc., 635 E. 18 St., O. C. Brock, pres. and mgr., rebuilding garage and service bldg. $40,000 or more.

Pa., Phila.—BAKERY—Hanscom Bros. Inc., E. E. Hanscom, pres., 9 N. 52 St., soon lets contract altering bakery. $50,000. J. E. Hopkins, 24 W. 40 St., New York, N. Y., archt.

Pa., Phila.—PLANT—Hyman Brodsky & Son Co., 3 St. and Lehigh Ave., repairing 1 story wood processing plant. $150,000.

Pa., Pittsburgh—LOFT—Colonial Management Co., E. O. Long, vice pres. in charge, 414 Wood St., 6 story, bsmnt., 20x60 ft. loft and store bldg. $40,000. Pittsburgh Office Furniture & Equip. Co., 216 Blvd. of Allies, lessee.

Pa., Ruffs Dale — DISTILLERY — Dillinger Distilleries, Inc., I. R. Weiner, vice pres. in charge, 12 S. 12 St., Phila., R. M. Howel, Ruffs Dale, mgr., 4 story, brick distillery and grain storage bldgs. $100,000.

R. I., Woonsocket—PLANT—Arthur Fontaine & Sons, 163 Rockland Ave., 1 story, bsmnt., brick, concrete mfg. plant, Rockland St. Over $40,000.

Tex., Austin—WAREHOUSE—Southwestern Ice & Cold Storage Co., 301 Colorado St., plans by C. H. Page & Son, Enfield-Gracy Bldg., 92x128 ft. warehouse. $45,000.

Tex., Houston—SHOP—Daniel Office Furniture Co., 5405 Clinton St., 1 story, 50x80 ft., steel corrugated iron shop. $40,000.

Tex., Houston—WAREHOUSE—Southern Engine & Pump Co., 300 St. Charles St., warehouse addn. alterations. $45,000. R. J. Cummins, Bankers Mortgage Bldg., engr.

Tex., Pharr—PLANT—Texas Products Co., Pharr, soon lets contract 1 and 2 story products packing plant, brick, hollow tile, rein.-con., sheet metal. $150,000. CD 1/11—ENR 1/18.

★**Tex., Waco**—PLANT—The General Tire & Rubber Co., E. F. Schnedarek, proj. mgr., Waco, plant expansion. $1,500,000.

Ont., Porcupine—DIAMOND DRILLING—Aquarius Mines, Ltd., Porcupine, diamond drilling in Night Hawk Lake Area. $100,000.

Ont., Timmins—PLANT—D. R. Franklin, archt., 219 Sky Block, soon lets contract 2 story, bsmnt., 64x102 ft., rein.-con., structural steel cold storage plant, for Northern Frosted Foods & Cold Storage Ltd., 3 Pine St. N. $65,000.

Que., Rouyn—DIAMOND DRILLING—Lake Expanse Gold Mines, Ltd., Rouyn, diamond drilling, shaft sinking, etc. $90,000 available.

BIDS ASKED

Bids Asked About February 5

Que., Lachine (Montreal)—FACTORY—Steel Co. of Canada, Ltd., 75 St. Joseph St., reconstructing Plant 4. $50,000. CD 1/9—ENR 1/11.

Bids Asked February 7

Ont., Toronto—PLANT—N. A. Armstrong, archt., 19 Melinda St., 1 story, 80x180 ft., steel, brick, concrete plant, for A. E. Jupp Const. Co. Ltd., 56 Boultbee Ave. CD 11/21—ENR 12/7.

Bids Asked About March 15

Pa., Phila.—PLANT—Samuel Bolder & Co., 826 Arch St., repairing mfg. plant. $40,000-$75,000. CD 1/4—ENR 1/11.

Bids Asked

Ill., Mt. Prospect—FACTORY—W. A. McDougall, archt., 140 S. Dearborn St., Chicago, 1 story, 125x175 ft. factory for Illinois Range Co., 800 S. Ada St.

Mont., Great Falls—DIESEL ENGINE SHOP—Great Northern Ry. Co., C. M. Nye, ch. engr., 175 E. 4 St., St. Paul, Minn., 50x222 ft., concrete, steel diesel engine shop with 25x113 ft. exten., brick walls. $200,000. T. D. MacMahon, c/o owner, archt. CD 8/2—ENR 8/10.

N. J., Paulsboro—LABORATORY—Socony Vacuum Oil Co., J. H. Wright, ch. engr., Paulsboro, research laboratory. $250,000. F. G. Frost, 144 E. 30 St., New York, N. Y., archt.

★**Tex., Houston**—PLANT—Kelly-Springfield Tire & Rubber Co., E. Burke, pres., Cumberland, Md., truck tire mfg. plant, La Porte Rd. $6,000,000. CD 1/19—ENR 1/25.

CONTRACTS AWARDED

Ala., Birmingham — PLANT — Alabama Metal Lath Co., 1631 Vanderbilt Rd., plant addn., to J. F. Holley Constr. Co., 905 6 Ave. N., $98,450. Chas H. McCauley, Jackson Bl., archt.

Calif., El Segundo — REFINERY STACK —Standard Oil Co. of California, 605 W. Olympic Bldg., Los Angeles, 200 ft. high concrete stack, and installing 2 boilers at refinery, to Foster-Wheeler Co., 714 W. Olympic Blvd., Los Angeles, approx. $200,000.

Conn., Fairfield—REPAIR SHOP and SERVICE GARAGE — Seaboard Freight Lines, Inc., 257 State St. exten., 1 story, bsmnt., 76x150 ft., concrete, structural steel repair shop and service garage, to J. J. Neverdousky, 1200 Mill Plain Rd. Est. $40,000. Fletcher Thompson, Inc., 211 State St., Bridgeport, engr. CD 12/29—ENR 1/4.

Conn., Norwalk—FACTORY—R. T. Vanderbilt, Inc., 33 Winfield St., 3 story, 35x80 ft., brick, rein.-con. factory, to Cuzzi Brothers & Singer, Inc., 10 S. 2 St., Mt. Vernon, N. Y. Est. $40,000. H. T. Lindeberg, 5 E. 57 St., New York, N. Y., archt. CD 1/4—ENR 1/11.

Ill., Chicago—FACTORY—Crown Rheostat & Supply Co., 1910 Maypole St., masonry contract for 1 story, 125x245 ft., brick factory, to O. Berglund, 8551 S. Bishop St. Est. $95,000. J. S. Cromelin, 6455 S. Central Ave., archt.

Ind., Indianapolis—FACTORY, etc.—Williamson Candy Co., 814 N. Senate Ave., 2 story, 102x204 ft., and 1 story, bsmnt., 40x60 ft., brick factory and office bldg., E. 38 St. and Nickel Plate Ry., to Carl Geupel Constr. Co., 923 Hume-Mansur Bldg. Est. $150,000. Awarded 1/23. Bohlen & Son, 1001 Farm Bureau Bldg., archt.

Mass., Boston — PLANT — Polaroid Mfg. Co., 209 Massachusetts Ave., Cambridge, general plant alterations, constructing partitions office facilities, to Walsh Brothers, 150 Hampshire St., Cambridge. $55,000

Mich., Grand Rapids—WAREHOUSE—Grand Rapids Wholesale Grocery Co., 1501 Buchanan St. S.W., brick, steel, concrete warehouse, to Datema Const. Co., 2 Sweet St. N.E. Est. $100,000.

Mich., Lansing—LAUNDRY—St. Lawrence Hospital, 1210 W. Saginaw St., brick, concrete laundry addn. to hospital group, to Reniger Constr. Co., 127 N. Cedar St. Est. $50,000.

N. Y., Jamestown—PLANT—Sylvania Electric Products, Inc., G. B. Erskine, mgr., Emporium, Pa., alterations imprvs., addns., etc., to former Broadhead Mills Bldg., E. 1 St., to Leo Ludwig Constr. Co., 20 W. Main St., Falconer, approx. $40,000. Awarded 1/18. Beck & Tinkham, Bailey Bldg., archts. C. B. Wagner, c/o owner, engr.

★**N. C., Plymouth**—PLANT—North Carolina Pulp Co., Plymouth, expanding mfg. plant, recovery and evaporation bldg., to C. F. Rohleder, 2134 Cherry St., Phila., Pa., $800,000. Carson & Carson, Commercial Trust Bldg., Phila., Pa., engrs. Awarded 1/12.

O., Newark—MILL—Pharis Tire & Rubber Co., Newark, foundation for 3 story, 50x150 ft., brick, steel mill, to Eseh Const. Co., Caxton Bldg., Cleveland. Est. $150,000. CD 1/9—ENR 1/11.

O., Willoughby—FACTORY—Ohio Rubber Co., E. Winegar, constr. engr., Ben Hur Ave., 1 story, 160x400 ft., brick, steel factory addn., to G. Rutland, 16 Brown Ave. Est. $225,000. CD 12/7—ENR 12/14.

Pa., Phila.—PLANT REPAIRS—Oxford Dye Works, O. W. Kerr, exec. in charge, 1408 E. Oxford St., repairing mfg. plant, to George K. Heebner, Inc., 1231 Vine St., $40,000. Awarded 1/12. CD 1/12—ENR 1/18.

Pa., Phila.—MARKET—Penn Fruit Co., S. Cooke, pres., 1500 E. Erie Ave., rebuilding super food market, to United Bldg. Constr. Corp., 246 S. 22 St. $150,000. Awarded 1/11. Thalheimer & Weitz, 1315 Walnut St., archts.

Pa., Phila.—PLANT—Sterling Metalware Co., E. Liepman, mgr., 2536 N. Reese St., repairing mfg. plant, to H. Marshall, 3314 Pennsgrove St., $40,000. Awarded 1/11. CD 1/4—ENR 1/11.

★**Pa., Pittsburgh**—SHELL PLANT—Jones & Laughlin Steel Corp., W. A. Morris, purch. agt., 3 and Ross Sts., shell plant, enclosing corrugated metal 6 open crane runways up to 250 ft. long, approx. 65 ft. wide, induction furnaces, electric furnaces, fdn. work, process piping, etc., to Rust Engineering Co., Clark Bldg. Est. $1,000,000. C. W. Littler, c/o owner, engr.

Tex., Freeport—PLANT—Dow Chemical Co., Freeport, rein.-con. plant, piping facilities, etc., to Tellepsen Constr. Co., 3900 Clay Ave., Houston, approx. $50,000. CD 11/28—ENR 11/30.

Tex., La Porte—PLANT CHIMNEY—E. I. duPont de Nemours & Co., La Porte, 150 ft. concrete chimney for chemical mfg. plant, to Rust Engineering Co., Clark Bldg., Pittsburgh, Pa., $144,000. CD 11/20—ENR 11/23.

Wash., Everett—PLANT—Soundview Pulp Co., Everett, log barking plant, to Howard S. Wright & Co., 407 Yale Ave. N., Seattle, Zone 9. $50,000.

Wash., Walla Walla—WAREHOUSE—Continental Can Co., 601 Myrtle St., Seattle, 1 story, 140x300 ft. brick warehouse addn., to The Austin Co., 16112 Euclid Ave., Cleveland, O. Est. $100,000. CD 12/13—ENR 12/21.

UNCLASSIFIED

PROPOSED WORK

Calif., Wilmington—TURNTABLE—Union Pacific R.R., B. H. Prater, ch. engr., 1416 Dodge St., Omaha, Neb., turntable, $110,400.

Conn., Fairfield—PARK DEVELOPMENT —Town, Park Bd., Town Hall, developing new park, Tunxis Hill Sect. $25,000. J. Ray, East Meadow Rd., Westport, engr.

Conn., Manchester—COMFORT STATIONS, etc.—Town, Bd. Selectmen, Town Hall, plans by Kane & Fairchild, 49 Pearl St., Hartford, three 1 story, 25x30 ft. comfort stations, Depot Sq., Manchester Green and Center Sts. CD 6/20—ENR 6/22.

UNCLASSIFIED (Proposed Work, Cont'd.)

Ia., Hawarden — AIRPORT — City, L. R. Ball, mayor, City Hall, airport imprvs. $25,000 bond election soon.

Louisiana — ELECTRIC TRANSMISSION LINES—Valley Electric Membership Corp., Natchitoches, 49.1 mi. rural electric power transmission lines, Natchitoches Co. $25,000. F. Horton & Co., Lamar, Mo., engrs.

★**Neb., Omaha** — AIRPORT — City, Wm. Milner, airport mgr., expan. airport. $1,250,000 bond election in spring.

†**N. M., Kirtland Field (br. Albuquerque)** —HANGARS—U. S. Eng., 4 and Gold Sts., Albuquerque, bids soon 3 hangars, Serial W 29-005-Eng. 45-35. $375,000.

Oklahoma—GAS GATHERING PIPELINE —Phillips Petroleum Co., Bartlesville, preliminary plans 70 mi. 2- to 20-in. west gas gathering pipeline sys., in West Edmond Field, serving wells and connecting with existing gasoline plants and compressor stations in main Oklahoma City field, $300,000. H. Kelly, First National Bank Bldg., Oklahoma City, engrs.

★**Texas**—GAS PIPELINE CARRIER—Lone Star Gas Co., 1915 Wood St., Dallas, soon lets contract 90 mi. 16- to 20-in. gas pipeline carrier between Trinidad and Carthage. $1,600,000. CD 10/25—ENR 11/2.

Texas—OIL PIPELINE—Humble Oil & Refining Co., Humble Bldg., Houston, 55 mi. crude oil pipeline from Imogene Field, Jourdanton area, to connect with main line running into Houston. $125,000.

Texas — RURAL ELECTRIFICATION LINES—Guadalupe Valley Cooperative, c/o E. A. Hassman mgr., Gonzales, making plans 60 mi. rural electrification lines, Gonzales Co. Beavers & Lodal, 1411 Transit Tower, San Antonio, engrs. CD 6/12—ENR 6/22.

Texas — RURAL ELECTRIFICATION LINES—Karnes Electric Cooperative, c/o R. H. Hoffman, mgr., Karnes City, making plans approx. 120 mi. addnl. rural electrification lines and some conversion, Karnes Co. Beaver & Lodal, 1411 Transit Towers, San Antonio, engrs. CD 5/17—ENR 5/25.

Tex., Charlotte—PIPELINE CARRIER—Humble Oil & Refining Co., Humble Bldg., Houston, laying approx. 20 mi. 8 in. crude oil pipeline carrier, steel. $40,000.

Tex., Commerce — AIRPORT HANGAR — City, rebuilding municipal airport hangar. $70,000.

Tex., Houston—DOCKS—Capitol Wholesale Drug & Liquor Co., 2300 McKinney Ave., rein.-con. loading dock. $25,000. I. R. Klein, 328 Bankers Mortgage Bldg., engr.

Tex., McAllen—GAS MAINS—City, laying 6 in. steel natural gas mains. $25,000.

Tex., San Antonio—SWIMMING POOL—City, bids soon rein.-con. outdoor standard type swimming pool, old Eagle Field. $100,000. M. L. Diver, 1504 Main St., engr.

Tex., Sinton—AIRPORT—Syndicate, c/o Kiwanis Club of Sinton, Sinton, airport runway. $25,000.

Tex., Texas City—SWIMMING POOL—Town, E. A. Johnson, mayor, rein.-con. swimming pool. $60,000. J. J. Rady, Insurance Bldg., Fort Worth, engr. CD 12/1—ENR 12/7.

Wyoming—PIPELINE CARRIER—Sinclair Refining Co., Riverton, 32 mi. 8 in. crude oil pipeline carrier, steel, from Creek's Gap to Big Sand Draw Field, Fremont Co. $90,000; 25 mi. 8 in. steel pipeline carrier, Fremont and Sweetwater Counties. $75,000.

†**Alaska, Ketchikan**—POWER DEVELOPMENT—City, City Hall, rejected bids Jan. 17, Beaver Falls power project. $400,000. **FWA.** H. B. Foss, Juneau, archt. R. W. Johnson, Arctic Bldg., 3 and Cherry Sts., Seattle 4, Wash., engrs. CD 1/26, under LB.

N. B., Renforth—LIGHTING SYSTEM—N. B. Hydro Electric Comn., Saint John, street lighting sys. $35,000.

Ont., Cobourg—FERRY SLIP REPAIRS—Municipality repairing ferry slip and adjoining pier. $30,000. Finance & Harbour Com., Cobourg, engr.

Ont., Windsor—RADIO STATION—Western Ontario Broadcasting Co., Inc., Guaranty Bldg., radio station. $40,000.

Que., Montreal — LIGHTING SYSTEM — Municipality, removing arc lamps and replacing with incandescent lights. $250,000.

Que., Montreal—PARK, etc.—Municipality, park on 68 acre site, north of Maplewood Ave., to include beach. $100,000.

Ont., Moosonee—TOURIST CAMP, etc.—Temiskaming & Northern Ontario Ry. Comn., S. B. Clement, ch. engr., North Bay, tourist facilities, camp, etc. $50,000.

BIDS ASKED

Bids Asked February 13

★†**Tex., Randolph Field**—AIRPORT—U. S. Eng., Fort Sam Houston, addnl. airfield construction, incl. excav. and embankment, complete in place, waste excav., common and select borrow, incl. channel excav. and embankment complete, flexible base, concrete pavement, intergral concrete curbing, asphalt stabilized shoulders, new fence, topsoil planting, water for topsoil, rein.-con. culvert pipe, concrete sewer pipe, catch basins, manholes, c.i. water pipe, electrical work, etc. Serial No. W-41-154-45-74. $2,014,172, CD 1/26—ENR 12/7.

Bids Asked

†**Ga., Savannah** — HANGARS, etc. — U. S. Eng., Post Office Bldg., addnl. hangars and paving at airport.

†**Mass., Waltham**—NURSES CALL SYSTEM—U. S. Eng., 31 St. James Ave., Boston, (selected list bidders) installing nurses call sys., Hope Ave., No. 19-023-45-NEG 78. $20,000.

Texas—PIPELINE GATHERING SYSTEM —Glenn H. McCarthy, Sterling Bldg., Houston, pipeline gathering sys., in Winnie. $75,000. CD 11/30—ENR 12/7.

Tex., Borger—PIPELINE CARRIER—Phillips Petroleum Co., Bartlesville, laying approx. 30 mi. 24 in. gas pipeline carrier, steel. $100,000.

LOW BIDDERS

★†**Ariz., Tucson** — AIRPORT IMPROVEMENT—U. S. Eng., 751 S. Figueroa St., Los Angeles, Zone 14, Calif., Jan. 22, airport imprv., from Basich Bros. Const. Co., 600 S. Fremont Ave., Alhambra, Calif., $942,815. CD 1/11—ENR 11/9.

†**Calif., Mira Loma** — AUTOMATIC SPRINKLER SYSTEM—U. S. Eng. 751 S. Figueroa St., Los Angeles, Zone 14, Jan. 23, automatic sprinkler sys. for 9 warehouses, at Quartermaster Depot, No. 202, from Fire Projection Engineering Co., 5636 Melrose Ave., Los Angeles, $263,797.

†**Calif., San Francisco** — TRACKAGE — U. S. Eng., 74 New Montgomery St., hospital car trackage at Crissy Field, San Francisco Presidio, Job. No. 1885-A, from A. D. Schader, 144 Spear St., $59,997.

Calif., Venice (br. Los Angeles)—BEACH IMPROVEMENTS—State, State Bldg., Los Angeles, Jan. 17, beach imprvs., 500 cu. yd. excav., 3,200 tons stone, from Case Constr. Co., P.O. Box 6, San Pedro, $50,450. G. T. McCoy, 803 State Bldg., Los Angeles, state engr.

†**Fla., Vero Beach** — RUNWAYS, etc. — Yards & Docks, Navy Dpt., 18 St. and Constitution Ave. N.W., Wash. 25, D. C., runways and taxiways, from J. H. Craggs, Ocala, $421,078.

★**La., Algiers** — WHARF — Todd-Johnson Dry Docks, Inc., Hinds Lane Wharf, New Orleans, and Algiers, Jan. 22, rein.-con. deck wharf on steel piles, gangway, track, altering wharves, dredging ship berth and basin for floating dry dock, from W. Horace Williams, Southern Bldg., New Orleans, pier work, $525,000; electrical work, from C. W. Nussbaum, 629 Julia St., $63,931. Fredric R. Harris, Inc., 27 Williams St., New York, N. Y., engr. CD 1/9—ENR 1/11.

†**La., Shreveport**—HANGAR—U. S. Eng., 300 Bway., Little Rock, Ark., hangar at Barksdale Field, Inv. No. 03-050-45-42, from E. O. Korsmo Constr. Co., Porter Bldg., Memphis 3, Tenn., $128,861.

†**Pa., Valley Forge (P. O. Phoenixville)**—SWIMMING POOL—U. S. Eng., Standard Oil Bldg., Baltimore, Md., Jan. 12, swimming pool, Valley Forge Hospital, from H. B. Alexander, 3 and Vaughan Sts., Harrisburg, $134,181. CD 11/8—ENR 11/16, under Public.

†**S. C., Chester**—AIRPORT—Civil Aeronautics Admin., 84 Marietta St. N.W., Atlanta, Ga., Jan. 12, airport, Proposal 25-234, from E. D. Sloan, Greenville, Item 131-E, $92,906. CD 1/4.

†**Va., Fort Myer (sta. Arlington)**—STEAM DISTRIBUTION SYSTEM—U. S. Eng., 1 and Douglas Sts. N.W., Wash. 25, D. C., Jan. 23, steam distr. sys., at South Post, from S. E. Dockstader, Munsey Bldg., Wash., D. C., $98,000. CD 1/19.

†**Va., Norfolk**—TELEPHONE SYSTEM ALTERATIONS, etc.—Yards & Docks, Navy Dpt., 18 St. and Constitution Ave. N.W., Wash. 25, D. C., Jan. 18, telephone, fire alarm and electrical sys. addns., alterations, Spec. 15626, NOY 11304, from Industrial Power Equipment Co., 5 E. Center St., Baltimore, Md., $33,400.

CONTRACTS AWARDED

Alabama — RURAL ELECTRIFICATION LINE—Tombigbee Electric Cooperative, Sulligent, 450.6 mi. rural electrification line serving 1081 members, Lamar Co., to Stuart C. Irby Co., 815 S. State Bldg., Jackson, Miss., $342,360. Bowman & Bowman, Greenwood, Miss., engrs.

†**Ala., Anniston**—HARDSTANDING AREA, etc.—U. S. Eng., Grant St., west of Westwood St., Mobile, hardstanding area and access roads, Anniston Ordnance Plant, Contr. W-01-076-eng-899, to J. E. Milam Constr. Co., Columbus, Ga., $194,104; salvage yard, access roads, railroad spur, fencing, Contr. W-01-076-eng-913, to Royce Kershaw & Co., Bell Bldg., Montgomery, $31,698.

Calif., Los Angeles—TURNTABLE—Union Pacific R. R., B. H. Pratt, ch. engr., 1416 Dodge St., Omaha 2, Neb., installing 135 ft. turntable at Los Angeles Union Terminal, Alameda and Macy Sts., own forces. $45,390. Steel purchased.

†**Calif., Muroc**—AIRFIELD BLDG.—U. S. Eng., 751 Figueroa St., Los Angeles, Zone 14, combination recreation bldg., Muroc Flight Test Base, Contr. W-04-352-eng-1356, to J. F. Cummins, Burbank, $32,731.

†**Calif., San Francisco**—OPEN STORAGE FACILITIES—Yards & Docks, Navy Dpt., 18 St. and Constitution Ave. N.W., Wash. 25, D. C., open storage facilities, Navy Overseas Freight Terminal, Spec. 15443, NOY 11144, to Piombo Bros., 1571 Turk St., $49,509. Bids 1/5.

†**Fla., Boca Raton**—AIRFIELD BLDG.—U. S. Eng., Post Office Bldg., Savannah, Ga., officer's service club and mess, Boca Raton Airfield, Contr. W-09-133-eng-550, to Gust K. Newberg Constr. Co., Miami, $99,996; addnl. bldgs., ventilation Contr. W-09-133-eng-552, to P. C. Lissenden Co., West Palm Beach, $75,735.

★†**Fla., Boca Raton**—AIRFIELD BLDGS. —U. S. Eng., 512 Spring St., Atlanta, Ga., school bldgs., officers quarters for airfield, to Algernon Blair, 1st Natl. Bank Bldg., Montgomery, Ala., $576,239. Bids 11/14. CD 11/28—ENR 11/30, under LB.

†**Fla., Daytona Beach**—SWIMMING POOL —U. S. Eng., Post Office Bldg., Savannah, Ga., swimming pool, etc., Welch Convalescent Hospital, Contr. W-09-133-eng-532, to Paul A. Miller Constr. Coo., Leesburg, $84,428.

†**Ga., Augusta**—SWIMMING POOL—U. S. Eng., Post Office Bldg., Savannah, swimming pool, Contr. W-09-133-eng-545, Oliver General Hospital, Clarence Mobley Constr. Co., Augusta, $133,269.

Kansas—TRANSMISSION LINES—Cooperative Power & Light Co., Iola, 153 mi. transmission lines, Allen Co., to A. F. Reis, National Bank of Topeka Bldg., Topeka, $157,000. Flora Eng. Co., 501 Jackson St., Topeka, engr.

†**Kan., Hutchinson**—AIRFIELD LIGHTING SYSTEM—Yards & Docks, Navy Dpt., 18 St. and Constitution Ave. N.W., Wash. 25, D. C., airfield lighting sys., to Burt & Binford, 507 W. 2 St., $85,009.

Missouri — TRANSMISSION LINES — Laclede Electric Cooperative, F. A. Jones, pres., Lebanon, 46 mi. transmission lines, Pulaski, Webster and Wright Counties, to Laclede, to Killoran Electric Co., 116 S. Superior St., Appleton, Wis., $49,433. Horton & Co., Lamar, engrs. CD 9/27.

†**N. J., Lakehurst**—SPRINKLER SYSTEM —Yards & Docks, Navy Dpt., 18 St. and Constitution Ave. N.W., Wash. 25, D. C., sprinkler sys., Naval Air Station, NOY 11351, to Grinnell Co., Erie Ave. and D St., Phila., Pa., $33,885.

†**Pa., Chambersburg**—SPRINKLER SYSTEMS—U. S. Eng., Standard Oil Bldg., Baltimore, Md., automatic sprinkler sys., Contr. W-18-020-eng-747, Letterkenny Ordnance Depot, to Grinnell Co. Inc., Erie Ave., and D St., Phila., $489,817.

R. I., East Providence—ROLLER SKATING RINK—William H. Noonan, 1184 South Bway., cinder block roller skating rink, Bway. Owner builds. $30,000.

Texas—RURAL ELECTRIC LINES—Dickens County Electric Cooperative, Dickens, 75 mi. rural electric lines Dickens Co., to Eugene Ashe Elec. Co., 415 Jones St., Fort Worth, $57,629. H. N. Roberts, 2415—20 St., Lubbock, engr.

Texas — RURAL ELECTRIFICATION LINES—Kimball Electric Cooperative, Inc., C. Kirk, mgr., Junction, approx. 150 mi. rural electrification lines, Kimble Co., to Taylor Constr. Co., Taylor, $88,085. Beavers & Lodal, 1411 Transit Tower, San Antonio, engrs.

†**Tex., El Paso**—SIGNALLING SYSTEM—U. S. Eng., P. O. Box 1538, Albuquerque, N. M., electric signalling sys., for Wm. Beaumont General Hospital Area, to Scotty Electric Co., 1111 5 St., Greeley, Colo., $25,000. CD 1/15—ENR 1/18.

†**Tex., Galveston**—RELOCATING RADIO RANGE—U. S. Eng., 25 St. and Avenue F, Galveston, relocating radio range, at Army Airbase, to Tellepsen Constr. Co., 3900 Clay St., Houston, $29,230. Est. $25,000. Bids about 12/28. CD 12/20—ENR 12/28.

†**Tex., Texarkana**—CLEANING SYSTEMS —U. S. Eng., 231 W. Main St., Denison, cleaning sys. alterations, addns., Lone Star Ordnance Plant, Contr. W-41-242-eng-402, to Homer A. Parks Constr. Co., Constr. Bldg., Dallas, est. $76,156.

†**W. Va., Clarksburg**—AIRPORT—Bd. Comrs. Harrison Co., Clarksburg, airport, clearing, grading, drainage, etc., Proposal 1-45-489, to Lane Constr. Co., 37 Colony St., Meriden, Conn. $62,465. CAA. CD 1/24, under LB—ENR 7/6.

Ont., Niagara Falls—TUNNEL—M. T. Gray, mgr.-secy. Niagara Parks Comn., 460 ft. tunnel at Table Rock House, under Horseshoe Falls to Robertson Const. & Engrg. Co. Ltd., 512 Clifton St., $45,940. Bids 1/5. CD 12/15—ENR 12/21.

Proposal Advertisements see p. 19